A8050-2

1983-1984 Economic Handbook of the Machine Tool Industry

Compiled by the Statistical Department

National Machine Tool Builders' Association
7901 Westpark Drive, McLean, Va. 22102
© Copyright 1983
$ 25.00
(NMTBA Members $14.00)

FOREWORD

For the U.S. machine tool industry 1982 was the second consecutive year in which market conditions, both in the United States and in our major export markets, deteriorated significantly. Domestic production of new machine tools totaled just over $3.6 billion, 18% below the level of the previous year. Even more alarming, the industry's net new orders suffered another year of substantial decline. After registering a total of $2.95 billion in 1981 (a 38% decline from 1980), net new orders for machine tools fell to $1.50 billion in 1982, a further 39% decline. Putting this into perspective, the volume of new orders received by the industry during 1982 was only about one quarter of those placed in 1979, the year of the last peak in the machine tool business cycle.

Over the course of the first six months of 1983, while the economy has been moving out of its 1982 recessionary environment, the machine tool industry finds itself still mired in the worst slump of the post-World War II era. New orders for the January-June period are 20% below the totals of the same period in 1982. Shipments, reflecting the lack of orders in 1982, are 56% below the comparable 1982 period. Most ominous for the industry is the continuing erosion of the backlog of new orders. After peaking at over $5.9 billion in early 1980, the backlog has fallen to just $950 million as of June and is a telling indicator of the "bare bones" state of most machine tool builders' level of operation.

As we go to print with the 1983-84 edition of this Handbook we are beginning to see the first hopeful signs of an economic recovery for the industry. Some major machine tool buying industries, most notably the automobile and appliance sectors are experiencing strong rebounds from their slumps. Strength in these industries implies renewed investment in new plant and equipment, a portion of which should go to machine tool builders. The critical question is one of timing; how much longer can the industry survive at its current level of orders and shipments?

A factor complicating the prospects for recovery in the domestic machine tool industry is the spectre of further import inroads into the American machine tool market. Imports comprised over 42% of the machine tools installed in the U.S. in 1982 and have shown every sign of maintaining or increasing this market share as the recovery unfolds.

It is because of the threat of import dominance in the machine tool market, the industrial backbone of American manufacturing and America's defense industries, that the NMTBA filed a petition for import relief with the Secretary of Commerce under Section 232 of the Trade Act of 1962, the national security clause. While the Association has long been a proponent of free trade and has one of the most active international trade promotion efforts in the trade association field, we cannot stand idly by while key segments of the American machine tool industry are decimated by targeted sales of foreign machine tools. Frequently assisted by subsidies and a variety of preferential programs sponsored by their respective governments, foreign builders have come to dominate certain key sectors of the domestic machine tool market, a fact we find inconsistent with our vital national interests. America is the defender of the industrial West and machine tools are the foundation of our industrial defense preparedness. We cannot allow the nation's defense to be eroded by a loss of our ability to produce, within our boundaries, the machine tools that are needed to maintain our national defense posture, i.e. our ability to produce sophisticated state-of-the-art weapons systems and our ability to deter aggression by our adversaries.

As we look forward into the 1980's and beyond we feel that the machine tool industry will be called upon to play an even more vital role in America's industrial structure. Since the turn of the century,

and especially in the post-World War II era, the United States has undergone a dramatic shift in its economy away from agriculture and manufacturing toward service industries. This has placed a responsibility on each farmer to produce more food to feed our expanding population and has placed an equivalent burden on each industrial employee to produce an ever larger volume of manufactured goods for each member of our society.

Just as mechanization was the answer to the problem of farm productivity, new and better capital equipment is the answer to the problem of industrial productivity. The machine tool industry looks forward to the technological challenge of obtaining more output from each manufacturing worker as it continues to provide its customers the world's most reliable, most productive machine tools.

The significance of the threat of machine tool imports goes far beyond the welfare of just the domestic machine tool building industry. If the domestic machine tool industry is allowed to be overwhelmed by foreign products the innovations and new manufacturing process technology that it provides America's manufacturing industries will be lost. Foreign firms will then have the upper hand in the development of new technology and will be the leaders in the drive to more efficient, lower-cost production of manufactured goods. The loss of America's machine tool building capability could well signal the beginning of the decline for all of America's metalworking manufacturing industries.

The 15th edition of the Economic Handbook again offers industry executives, market researchers, legislators, administrators and students an expanded collection of data on the economy and the industry.

Wide fluctuations in currencies and varied definitions of different time periods account for occasional differences in the data for what appear to be identical subjects in this Handbook. As far as possible, these differences are explained in the chapter introductions, footnotes and the "Explanation of Terms" section at the end of the Handbook. Special explanatory notes for selected data series are also included. The NMTBA Statistical Department is also available to answer any questions concerning this publication. We are constantly trying to improve the value of this book. Your comments and suggestions for future editions are welcome.

James A Gray

James A. Gray
President

August, 1983

NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION

Officers and Directors

Chairman: Nathaniel S. Howe
Senior Vice President
Litton Industries, Inc.
Group Executive
Machine Tool Systems Group
Hartford, Connecticut

1st Vice Chairman: W. Paul Cooper
Chairman of the Board
Acme-Cleveland Corporation
Cleveland, Ohio

2nd Vice Chairman: James L. Koontz
President & C. E. O.
Kingsbury Machine Tool Corporation
Keene, New Hampshire

Treasurer: Glenn D. Babbitt
President & C. E. O.
Oerlikon Motch Corporation
Cleveland, Ohio

Secretary: William E. Blum
President
Armstrong-Blum Mfg. Co.
Chicago, Illinois

Directors:

Raymond H. Blakeman
President
The Ruesch Group, Inc.
Iowa Precision Industries, Inc.
Cedar Rapids, Iowa

James A. Currie, Sr.
President
Erie Press Systems
Erie, Pennsylvania

Charles E. Gilbert, Jr.
President
The Cincinnati Gilbert Machine Tool Company
Cincinnati, Ohio

Albert W. Moore
President
Gleason Machine Division
Gleason Works
Rochester, New York

Donald A. Roach
President & C. E. O.
Brown & Sharpe Manufacturing Co.
N. Kingstown, Rhode Island

William Truska, Jr.
President
Rousselle Corporation
Chicago, Illinois

Harold J. Winch
President & Chairman of the Board
The Minster Machine Co.
Minster, Ohio

Ex-Officio:
William C. Gallmeyer
President
Gallmeyer & Livingston Company
Grand Rapids, Michigan

Craig R. Smith
Chairman
Industrial Group
The Bendix Corporation
Cleveland, Ohio

Association Staff:

James A. Gray, *President*
Elwood H. Hasemann, *Exhibition Director*
Mark J. Nuzzaco, *Administrative Director*
William Atkinson, Jr., *Safety Director*
James H. Mack, *Public Affairs Director*
Jesse Maffuid, *International Trade Director*
John Mandl, *Training Director*
Charles Pollock, *Public Relations Director*
John B. Deam, *Technical Director*
Anthony M. Bratkovich, *Engineering Director*
Joe T. Franklin, Jr., *Statistical Director*
Francis Mason, *Controller*

NATIONAL MACHINE TOOL BUILDERS' SHOW, INC.

Officers and Directors

Chairman and Director: Raymond H. Blakeman
President
The Ruesch Group, Inc.
Iowa Precision Industries, Inc.
Cedar Rapids, Iowa

President and General Manager: James A. Gray
President
National Machine Tool Builders' Association

Vice President and Show Manager: Elwood H. Hasemann
Exhibition Director
National Machine Tool Builders' Association

Secretary-Treasurer and Director: Glenn D. Babbitt
President & C.E.O.
Oerlikon Motch Corporation

Assistant Secretary: Mark J. Nuzzaco
Administrative Director
National Machine Tool Builders' Association

Assistant Treasurer: Francis Mason
Controller
National Machine Tool Builders' Association

Directors:
James L. Koontz
President
Kingsbury Machine Tool Corporation

W. Paul Cooper
Chairman of the Board
Acme-Cleveland Corporation

Leon J. Dunn
President
New Britain Machine Division
Litton Industrial Products, Inc.

Nathaniel S. Howe
Senior Vice President
Litton Industries, Inc.

Nathaniel S. Howe
Senior Vice President
Litton Industries, Inc.
Group Executive
Machine Tool Systems Group

T. J. Wiedemann
Vice President & Group Executive
Industrial Group
The Bendix Corporation

Contents

National Economy and Machine Tools 1 1

World Economy 43 2

U.S. Machine Tool Industry 59 3

U.S. Machine Tool Shipments and Orders 75 4

U.S. Machine Tool Foreign Trade 121 5

World Machine Tool Industry 161 6

Employment and Earnings 233 7

Finance 251 8

Machine Tools in Use 259 9

Abbreviations II

Explanation of Terms III

Index xvii

TECHNICALLY SPEAKING...

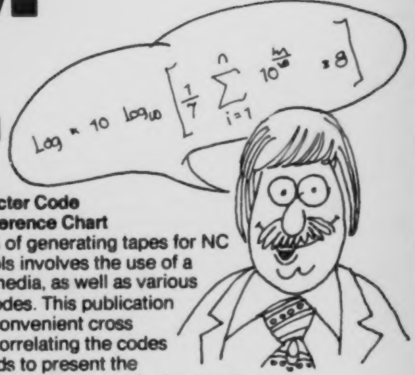
NMTBA offers a series of nine technical publications that contain suggestions, guidelines and information to make your company's operation more efficient and productive.

1 **Guidelines for the Measurement of Machine Tool Utilization**
This publication suggests a uniform procedure for the measurement and reporting of machine tool utilization. It provides a system to measure the effectiveness of a wide variety of machines and their related resources. It establishes indices of production, availability, utilization and consistent methods for their evaluation.

2 **Noise Measurement Techniques**
This publication suggests the most recent measuring techniques and procedures for the determination of machine tool sound. A discussion of time-weighted average sound levels is included, as well as a discussion of the disagreement between OSHA and EPA as to the basis for computing noise dosage.

3 **Definition and Evaluation of Accuracy and Repeatability of NC Machine Tools**
his publication was prepared to help develop a better under-tanding of the accuracy and repeatability of numerically ontrolled machine tools. Definitions, methods of computation nd testing procedures are thoroughly discussed. This paper s recognized in the COCOM (Coordinating Committee) Regula-ions which govern the export licensing of NC machine tools.

4 **Common Words As They Relate to NC Software**
The aim of this publication is to improve communication mong those involved with NC computer software. It defines he common terms used throughout the industry including hose regarding the preparation and use of computer software for numerically controlled machine tools.



5 **NC Character Code Cross Reference Chart**
The process of generating tapes for NC machine tools involves the use of a number of media, as well as various character codes. This publication provides a convenient cross reference, correlating the codes and standards to present the needed information in a single document.

6 **Standards Index**
A bibliography of standards pertinent to the design, manufacture, sale and use of machine tools.

7 **Selecting an Appropriate NC Programming Method**
Selecting the best NC programming method for a particular set of manufacturing circumstances is an important decision for new and established NC shops alike. The implications of this decision are manifold and an incorrect decision can adversely affect the expected return on high cost capital equipment. This publication explains the elements of manual and computer-aided programming and will help you in selecting the right method for your shop.

8 **NC is EZ**
This publication is intended as a practical and easy to understand NC primer. It will help prospective first-time NC users plan and execute the installation and start-up of new equipment with a minimum of difficulty.

9 **NC Part Programming Profile and Summary Report**
This survey and summary report provides data useful to companies to compare their own NC programming efforts with other shops having a similar number of NC machines. It puts in proper perspective the NC programming effort required at shops considering acquisitions – perhaps first-time – of machine tools.

national
machine
tool builders'
association

1

NATIONAL ECONOMY AND MACHINE TOOLS

Man is a tool-making animal. Since the beginning of history man has used his tools to make even better tools. The culmination of these efforts are today's modern machine tools. These are the machines that form the basis of much of our modern civilization.

A machine tool is a power-driven machine, not hand held, that is used to cut, form, or shape metal. Few, if any, products and services of an industrialized country would exist if it were not for machine tools. There would be no trains, no ships, no planes, no cars. There would be no power plants, no electric lights, no refrigerators, or other electrical appliances. And, without agricultural machines, without modern transportation, and without refrigeration—all dependent on modern machine tools—there would be no way to feed the more than 220 million people in this country.

Yet, such is the efficiency and longevity of the products of the machine tool industry that its present production has always represented only a small part of the nation's total output. The entire U.S. machine tool industry is smaller than many individual corporations. Even the limited data available for the first years of this century show, for instance, that metalcutting machine tools made up only slightly more than 10 cents for every $100 produced in goods and services. In 1982, shipments of complete machine tools made up just over 12 cents of every $100 of Gross National Product.

Comparisons of machine tool consumption with capital expenditures by durable goods manufacturing industries show that machine tools make up a comparatively small but significant part of total expenditures for plant, machinery, and other equipment.

Machine tools are typically installed as capital equipment in metalworking industries. The data on machine tools installed in U.S. plants (see Chapter 9) and data collected by NMTBA indicate that the major users of machine tools are the metalworking industries: fabricated metal products, machinery, and transportation equipment (among the latter, primarily the automobile and aerospace industries). Thus, this chapter focuses on private investment, on expenditures for new plant and equipment, and on the orders and shipments of the metalworking industries. The business activity in these industries is likely to affect their capital expenditures and, in turn, to affect the orders that flow to the machine tool industry. However, many other factors also seem to affect the ordering of new machine tools.

The machine tool industry is highly sensitive to the treatment of corporate capital consumption allowances such as investment tax credits and depreciation. Changes in these affect the willingness and ability of the industry's customers to make machine tool purchases. The work of many students of the machine tool industry has indicated that corporate profitability, financial conditions, and the general level of business confidence are also important determinants of machine tool order activity.

Capacity utilization is recognized as another significant determinant of future business investment in plant equipment and thus in machine tools. While attempts to measure the utilization in a broad spectrum of industries are fairly recent, there are several existing series on capacity utilization in manufacturing. In this issue, three of the available measures are presented. Also included are capacity utilization series for selected machine tool consuming industries as published by the Bureau of Economic Analysis and the McGraw-Hill Publications Company.

Currently, there is much concern in the United States about the erosion of our capital stock. For instance, studies have shown that the average age of the machine tool population in this country has gone up significantly in recent years. Investment apparently has not kept up with the need to replace aging capital assets in U.S. manufacturing industries. Several tables showing the stock of capital assets in various machine tool consuming industries are in this chapter. Of particular interest are the tables relating purchases and depreciation of capital goods in manufacturing industries, and the tables of business capital appropriations in current and constant dollars.

Many figures shown in this chapter are in current dollars . . . dollars not adjusted for changes in purchasing power. Overall changes in the purchasing power of the dollar, as measured by producer or consumer prices indexes, provide a measure of the erosion of its value. To measure the impact of price increases, several indexes and "price deflators" to generate "constant dollar" figures are available. These include indexes of producer prices for metal cutting and metal forming machine tools. However, because these indexes make no adjustments for changes in the qualitative characteristics of machine tools, they should be used with caution.

Maintenance and expansion of the export market for U.S. machine tools, and the impact of machine tool imports on the domestic market, have been matters of concern to U.S. machine tool builders during most of this century. Until 1978, the U.S. machine tool balance of trade had continuously been positive and had helped offset trade deficits incurred in other sectors. The development of a sizable balance of trade deficit in machine tools is particularly troubling because the competitive impact of machine tool imports is understated in current statistics. The value data for imports exclude important cost elements such as insurance and ocean freight which also affect the balance of payments. These shortcomings of the foreign trade statistics are discussed in Chapter 5, as are other detailed aspects of machine tool foreign trade.

To protect and expand foreign markets many U.S. businesses have established plants in foreign countries. Direct foreign investment increased rapidly during the

1960's and 1970's and U.S. machine tool builders joined this move. While no information is available on machine tool direct foreign investment, data are presented for U.S. direct foreign investments in various countries by all industries and by manufacturing industries.

Definitions and discussions of the terms used in this and other chapters are in the glossary at the end of this book.

THE NATIONAL ECONOMY AND MACHINE TOOLS
1958 to Date

Year	GNP Billion $	Shipments in Billion Dollars: All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Shipments in Million Dollars: Machine Tool Industry	Machine Tool Products	Complete Machine Tools
1958	$ 449.7	$ 327.0	$ 162.8	$ 23.4	$ 998	$ 870	$ 591
1959	487.9	363.4	187.3	26.6	1,112	975	616
1960	506.5	370.5	190.6	26.8	1,266	1,126	744
1961	524.6	371.1	187.4	26.6	1,242	1,102	751
1962	565.0	400.3	207.1	29.2	1,430	1,223	821
1963	596.7	420.7	219.4	31.0	1,502	1,370	896
1964	637.7	448.0	235.6	35.3	1,791	1,650	1,164
1965	691.1	491.9	266.7	39.5	2,107	1,955	1,426
1966	756.0	538.4	295.8	46.9	2,554	2,319	1,685
1967	799.6	557.8	303.2	49.2	2,841	2,585	1,806
1968	873.4	603.2	332.4	51.0	2,817	2,500	1,727
1969	944.0	642.5	353.7	56.1	2,835	2,507	1,598
1970	992.7	634.0	338.6	56.5	2,598	2,278	1,443
1971	1,077.6	671.1	359.7	56.0	2,019	1,698	998
1972	1,185.9	756.3	408.3	65.8	2,112	1,929	1,019
1973	1,326.4	875.2	476.2	77.8	2,777	2,596	1,501
1974	1,434.2	1,017.5	530.7	92.5	3,580	3,189	2,031
1975	1,549.2	1,039.1	523.9	95.8	3,834	3,432	2,452
1976	1,718.0	1,185.6	608.3	105.5	3,567	3,197	2,060
1977(r)	1,918.3	1,358.4	711.2	122.2	3,943	3,675	2,281
1978(r)	2,163.9	1,522.9	814.2	143.2	4,978	4,735	3,013
1979(r)	2,417.8	1,727.2	912.7	166.5	6,053	5,762	3,877
1980(r)	2,633.1	1,852.7	930.6	180.7	6,981	6,702	4,692
1981(r)	2,937.7	2,017.5	1,006.5	201.5	7,481	7,206	5,096
1982(p)	3,059.3	1,910.1	922.1	180.6	NA	NA	3,604

NA - Not Available. p - Preliminary. r - Revised.

Sources: Col. 1: U.S. Department of Commerce, "Business Statistics, 1977" and "Survey of Current Business" (monthly). Cols. 2, 3 and 4: U.S. Bureau of the Census. "Manufacturers' Shipments, Inventories and Orders: 1967-1978" (revised) and Series M3-1 (monthly). Cols. 5 and 6: U.S. Bureau of the Census, "Annual Survey of Manufactures," M (AS)-1 & 2 and 1977 "Census of Manufactures". Col. 7: National Machine Tool Builders' Association, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

The last three columns cover the following three different entities.

Machine Tool Industry: (Standard Industrial Classifications 3541 and 3542). All shipments orginating in establishments whose primary products are machine tools. The figures include other-than-machine tools produced in these establishments as well as miscellaneous receipts.

Machine Tool Products: All machine tool products shipped by the machine tool industry and by other industries. Excludes all shipments of items which are not classified as machine tool products.

Complete Machine Tools: Shipments of complete machine tools, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines, as reported by NMTBA.

THE NATIONAL ECONOMY AND MACHINE TOOLS

Indexes, 1958 to Date

1967 Shipments = 100

Year	GNP	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry (a)	Machine Tool Products (a)	Complete Machine Tools (a)
1958	56.2	58.6	53.7	47.6	35.1	33.7	32.7
1959	61.0	65.1	61.8	54.1	39.1	37.7	34.1
1960	63.3	66.4	62.9	54.5	44.6	43.6	41.2
1961	65.6	66.5	61.8	54.1	43.7	42.6	41.6
1962	70.7	71.8	68.3	50.3	50.3	47.3	45.5
1963	74.6	75.4	72.4	63.0	52.9	53.0	49.6
1964	79.8	80.3	77.7	71.7	63.0	63.8	64.5
1965	86.4	88.2	88.0	80.3	74.2	75.6	79.0
1966	94.5	96.5	97.6	95.3	89.9	89.7	93.3
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	109.2	108.1	109.6	103.7	99.2	96.7	95.6
1969	118.1	115.2	116.7	114.0	99.8	97.0	88.5
1970	124.1	113.7	111.7	114.8	91.4	88.1	79.9
1971	134.8	120.3	118.6	113.8	71.1	65.7	55.3
1972	148.3	135.6	134.7	133.7	74.3	74.6	56.4
1973	165.9	156.9	157.1	158.1	97.7	100.4	83.1
1974	179.4	182.4	175.0	188.0	126.0	123.4	112.5
1975	193.7	186.3	172.8	194.7	135.0	132.8	135.8
1976	214.9	212.5	200.6	214.4	125.6	123.7	114.1
1977	239.9	243.5	234.6	248.4	138.8	142.2	126.3
1978(r)	270.6	273.0	268.5	291.1	175.2	183.2	166.8
1979(r)	302.4	309.6	301.0	338.4	213.1	227.9	214.7
1980(r)	329.3	332.1	306.9	367.5	245.7	259.3	259.8
1981(r)	367.4	361.7	332.0	409.6	263.3	278.8	282.2
1982(p)	382.6	342.4	304.1	367.1	NA	NA	199.6

NA - Not Available. p - Preliminary. r - Revised.

(a) See notes on page 4.

Sources: U.S. Department of Commerce, U.S. Bureau of the Census, and NMTBA.

GROSS NATIONAL PRODUCT AND COMPONENTS
1960 to Date

Year	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
In current dollars (billions)					
1960	506.5	324.9	75.9	5.5	103.0
1961	524.6	335.0	74.8	6.6	108.2
1962	565.0	355.2	85.4	6.4	118.0
1963	596.7	374.6	90.9	7.6	123.7
1964	637.7	400.5	97.4	10.1	129.8
1965	691.1	430.4	113.5	8.8	138.4
1966	756.0	465.1	125.7	6.5	158.7
1967	799.6	490.3	122.8	6.3	180.2
1968	873.4	536.9	133.3	4.3	199.0
1969	994.0	581.8	149.3	4.2	208.8
1970	992.7	621.7	144.2	6.7	220.1
1971	1,077.6	672.2	166.4	4.1	234.9
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,326.4	812.0	229.8	14.2	270.4
1974	1,434.2	888.1	228.7	13.4	304.1
1975	1,549.2	976.4	206.1	26.8	339.9
1976	1,718.0	1,084.3	257.9	13.8	362.1
1977(r)	1,918.3	1,204.4	324.1	−4.0	393.8
1978(r)	2,163.9	1,346.5	386.6	−1.1	431.9
1979(r)	2,417.8	1,507.2	423.0	13.2	474.4
1980(r)	2,633.1	1,667.2	402.3	25.2	538.4
1981(r)	2,937.7	1,843.2	471.5	26.1	596.9
1982	3,059.3	1,971.1	420.3	20.5	647.4
In constant 1972 dollars (billions)					
1960	737.1	452.0	104.7	7.7	172.8
1961	756.6	461.4	103.9	8.5	182.9
1962	800.3	482.0	117.6	7.5	193.2
1963	832.5	500.5	125.1	9.4	197.6
1964	876.4	528.0	133.0	12.8	202.6
1965	929.3	557.5	151.9	10.1	209.8
1966	984.8	585.7	163.0	6.5	229.7
1967	1,011.4	602.7	154.9	5.4	248.5
1968	1,058.1	634.4	161.6	1.9	260.2
1969	1,087.6	657.9	171.4	0.9	257.4
1970	1,085.6	672.1	158.5	3.9	251.1
1971	1,122.4	696.8	173.9	1.6	250.1
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,255.0	768.5	217.5	15.5	253.5
1974	1,248.0	763.6	195.5	27.8	261.2
1975	1,233.9	780.2	154.8	32.2	266.7
1976(r)	1,298.2	823.1	184.5	25.4	265.2
1977(r)	1,369.7	864.3	214.2	22.0	269.2
1978(r)	1,438.6	903.2	236.7	24.0	274.6
1979(r)	1,479.4	927.6	236.3	37.2	278.3
1980(r)	1,474.0	930.5	208.4	50.6	284.6
1981(r)	1,502.6	947.6	225.8	42.0	287.1
1982	1,476.9	956.9	196.9	31.8	291.3

r - Revised.

Note: Individual components may not add to total GNP due to rounding.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

ACTUAL AND PROJECTED GNP AND OTHER ECONOMIC INDICATORS

	Measure	Actual 1980(r)	Actual 1981(r)	Actual 1982(r)	Projection 1983
Gross National Product	Bil. $	$2.633.1	$2.937.7	$3.059.3	$3.265.0
GNP in Constant Dollars	Bil. 1972 $	1.480.7	1.502.6	947.6	1.503.0
GNP Implicit Price Deflator	1972 = 100	177.4	195.5	207.2	216.7
Industrial Production	1967 = 100	147.1	151.0	138.6	141.0
Unemployment Rate	Percent	7.2%	7.6%	9.7%	10.2%
Corporate Profits After Taxes	Bil. $	$ 163.2	$ 150.9	$ 117.1	$ 131.0
Non-Residential Fixed Investment	Bil. 1972 $	166.1	172.0	165.8	155.0
Change in Business Inventories	Bil. 1972 $	−5.0	9.0	−9.2	0.5
Personal Consumption Expenditures	Bil. 1972 $	935.1	947.6	956.7	985.2
Federal Government Purchases	Bil. 1972 $	108.1	110.4	116.4	122.0

r - Revised.

Sources: Actual: U.S. Department of Commerce. "Survey of Current Business" (monthly). Projected: American Statistical Association and National Bureau of Economic Research panel of forecasters "Economic Outlook USA, Spring 1982."

SELECTED PRICE DEFLATORS
1963 to Date

Year	Price Deflators: Gross National Product	Personal Consumption Expenditure	Producers' Durable Equipment	Metal-Working Machinery & Equipment
	1972 = 100			
1963	71.7	74.8	79.7	72.8
1964	72.8	75.9	80.1	74.3
1965	74.4	77.2	80.6	76.3
1966	76.8	79.4	82.1	79.8
1967	79.1	81.4	84.3	83.2
1968	82.5	84.6	87.2	86.5
1969	86.8	88.4	89.9	89.7
1970	91.4	92.5	93.2	94.8
1971	96.0	96.5	97.2	97.6
1972	100.0	100.0	100.0	100.0
1973	105.7	105.7	101.8	104.4
1974	114.9	116.2	109.3	122.2
1975	125.6	125.2	126.2	142.8
1976(r)	132.3	131.7	133.9	152.0
1977(r)	140.1	139.3	141.0	165.1
1978(r)	150.4	149.1	149.7	180.5
1979(r)	163.4	162.5	158.8	200.7
1980(r)	178.6	179.2	169.0	228.3
1981(r)	195.5	194.5	179.8	250.7
1982	207.2	206.0	183.4	266.9

r - Revised.

Note: Gross National Product, Personal Consumption Expenditures and Producers' Durable Equipment values are "Implicit Price Deflators"; Metal-Working Machinery and Equipment values are "Producer Price Indices."

Source: U.S. Department of Commerce. "Business Statistics," 1977; "Survey of Current Business" (monthly). U.S. Department of Labor, Bureau of Labor Statistics.

Price deflators are used to express changes over a period of time in constant dollars. The implicit price deflator for GNP is a weighted average of the price indexes used to deflate the components of GNP. It is generally regarded as the best single measure of broad price movements in the economy as a whole.

GROSS NATIONAL PRODUCT AND GOVERNMENT RECEIPTS
Selected Years, 1938 to Date
(Values in Billions of Dollars)

Year	GNP	Total Gov't Receipts	Percent of GNP	Federal Gov't Receipts	Percent of GNP	State & Local Gov't Receipts	Percent of GNP
1938	$ 85.0	$ 15.0	17.7%	$ 6.5	7.7%	$ 9.3	10.9%
1945	212.4	53.2	25.1	42.5	20.0	11.6	5.5
1950	286.5	69.0	24.1	50.0	17.5	21.3	7.4
1955	400.0	101.1	25.3	72.6	18.2	31.7	7.9
1960	506.5	139.5	27.5	96.1	19.0	49.9	9.9
1965	691.1	188.3	27.3	124.3	18.0	75.1	10.9
1970	992.7	302.8	30.5	191.9	19.3	135.4	13.6
1973	1,326.4	413.1	31.1	258.6	19.5	195.0	14.7
1974	1,434.2	455.2	31.7	287.8	20.1	211.4	14.7
1975	1,549.2	470.5	30.1	287.3	18.5	237.7	15.3
1976	1,718.0	538.4	31.3	331.8	19.3	267.8	15.6
1977(r)	1,918.3	605.4	31.6	375.2	19.6	297.7	15.5
1978(r)	2,163.9	681.9	31.5	431.6	19.9	327.6	15.1
1979(r)	2,417.8	765.1	31.6	493.6	20.4	352.0	14.6
1980(r)	2,633.1	838.0	31.8	540.7	20.5	385.9	14.7
1981(r)	2,937.7	957.3	32.6	628.2	21.4	416.8	14.2
1982(p)	3,059.3	968.4	31.7	614.7	20.1	437.3	14.3

p - Preliminary. r - Revised.

Note: Federal grants-in-aid to State and local governments are reflected in State and local receipts. Total government receipts have been adjusted to eliminate this duplication.

Source: "Economic Report of the President," February, 1983, and earlier editions.

CORPORATE PROFITS AND TAX
Selected Years, 1938 to Date
(Billions of Dollars)

Year	Corporate Profits Before Taxes	Profits Tax Liability	Profits After Tax	Net Dividend Payments	Undistributed Profits
1938	$ 4.0	$ 1.0	$ 2.9	$ 3.2	$ 0.2
1945	19.7	10.7	9.0	4.6	4.4
1950	42.6	17.9	24.7	8.8	15.9
1955	48.4	22.0	26.4	10.3	16.1
1960	48.5	22.7	25.8	12.9	13.0
1965	75.2	30.9	44.3	19.1	25.2
1970	71.5	34.5	37.0	22.9	14.1
1973	115.8	48.7	67.1	27.8	39.3
1974	126.9	52.4	74.5	31.0	43.6
1975	120.4	49.8	70.6	31.9	38.7
1976(r)	152.0	63.8	88.2	29.1	59.1
1977(r)	179.6	72.7	106.9	30.5	76.4
1978(r)	209.4	83.2	126.2	36.5	89.7
1979(r)	222.1	87.6	134.5	37.6	96.9
1980(r)	212.1	84.7	127.5	39.7	87.8
1981(r)	209.3	81.2	128.1	50.8	77.3
1982	156.8	57.7	99.1	60.2	38.9

r - Revised.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

THE FEDERAL BUDGET
Fiscal Years, 1930 to Date
(Billions of Dollars)

Year	Receipts	Outlay	Surplus or Deficit (−)	Year	Receipts	Outlay	Surplus or Deficit (−)
1930	$ 4.1	$ 3.3	$ 0.7	1960	$ 92.5	$ 92.2	$ 0.3
1931	3.1	3.6	−0.5	1961	94.4	97.8	−3.4
1932	1.9	4.7	−2.7	1962	99.7	106.8	−7.1
1933	2.0	4.6	−2.6	1963	106.6	111.3	−4.8
1934	3.0	6.6	−3.6	1964	112.7	118.6	−5.9
1935	3.7	6.5	−2.8	1965	116.8	118.4	−1.6
1936	4.0	8.4	−4.4	1966	130.9	134.7	−3.8
1937	5.0	7.7	−2.8	1967	148.9	157.6	−8.7
1938	5.6	6.8	−1.2	1968	153.0	178.1	−25.2
1939	5.0	8.8	−3.9	1969	186.9	183.6	3.2
1940	6.4	9.5	−3.1	1970	192.8	195.7	−2.8
1941	8.6	13.6	−5.0	1971	187.1	210.2	−23.0
1942	14.4	35.1	−20.8	1972	207.3	230.7	23.4
1943	23.6	78.5	−54.9	1973	230.8	245.6	−14.8
1944	44.3	91.3	−47.0	1974	263.2	267.9	−4.7
1945	45.2	92.7	−47.5	1975	279.1	324.2	−45.2
1946	39.3	55.2	−15.9	1976	298.1	364.5	−66.4
1947	38.4	34.5	3.9	Tr. Qtr.	81.2	94.2	−13.0
1948	41.8	29.8	12.0	1977	355.6	400.5	−44.9
1949	39.4	38.8	0.6	1978	399.6	448.4	−48.8
1950	39.5	42.6	−3.1	1979	463.3	491.0	−27.7
1951	51.6	45.5	6.1	1980	517.1	576.7	−59.6
1952	66.2	67.7	−1.5	1981	599.3	657.2	−57.9
1953	69.6	76.1	−6.5	1982(r)	617.8	728.4	−110.6
1954	69.7	70.9	−1.2	1983E	597.5	805.2	−207.7
1955	65.5	68.5	−3.0	1984E	659.7	848.5	−188.8
1956	74.5	70.5	4.1				
1957	80.0	76.7	3.2				
1958	79.6	82.6	−2.9				
1959	79.2	92.1	−12.9				

E - Estimate. r - Revised.

Tr. Qtr.—Transition Quarter: Beginning with the 1977 Federal Budget, the fiscal year runs from October 1 through September 30. To facilitate the conversion, a three-month transition period was provided between fiscal years 1976 and 1977.

Note: 1930 to 1939: Administrative Budget: 1940 to 1953: Consolidated Cash Statement: 1954 to Date: Unified Budget.

Source: "Economic Report of the President," February 1983 and earlier editions.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT
1959 to Date
(Values in Billions of Current Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1959	$ 487.9	$ 45.9	9.4%	$ 28.3	5.8%
1960	506.5	48.5	9.6	29.7	5.9
1961	524.6	48.0	9.1	28.9	5.5
1962	565.0	52.2	9.2	32.1	5.7
1963	596.7	54.8	9.2	34.4	5.8
1964	637.7	61.0	9.6	38.7	6.1
1965	691.1	72.7	10.5	45.8	6.6
1966	756.0	83.1	11.0	53.0	7.0
1967	799.6	83.9	10.5	53.7	6.7
1968	873.4	90.6	10.4	58.2	6.7
1969	994.0	101.3	10.2	64.6	6.5
1970	992.7	103.3	10.5	65.1	6.6
1971	1,077.6	107.9	10.0	67.4	6.3
1972	1,185.9	121.0	10.2	76.8	6.5
1973	1,326.4	143.3	10.8	92.3	7.0
1974	1,434.2	156.6	10.9	100.6	7.0
1975	1,549.2	157.7	10.2	102.3	6.6
1976(r)	1,718.0	174.1	10.1	115.3	6.7
1977(r)	1,918.3	205.2	10.7	140.8	7.3
1978(r)	2,163.9	248.9	11.5	170.2	7.9
1979(r)	2,417.8	290.2	12.0	191.9	7.9
1980(r)	2,633.1	309.2	11.7	198.6	7.5
1981(r)	2,937.7	346.1	11.8	216.4	7.4
1982	3,059.3	348.0	11.4	206.5	6.7

r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

Gross private fixed nonresidential domestic investment includes capital expenditures by the domestic business sector for (1) new and replacement construction (e.g., buildings, stores, and warehouses) and (2) producers' durable equipment. Expenditures for producers' durable equipment include the new and replacement purchases of automobiles, trucks, various types of machinery, and other equipment used by the private sector in the production of goods and services.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT IN CONSTANT DOLLARS

1948 to Date

(Values in Billions of 1972 Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1948	$ 489.8	$ 51.1	10.4%	$ 32.6	6.6%
1949	492.2	46.0	9.3	28.1	5.7
1950	534.8	50.0	9.3	30.8	5.8
1951	579.4	52.9	9.1	32.2	5.6
1952	600.8	52.1	8.7	31.5	5.2
1953	623.6	56.3	9.0	33.7	5.4
1954	616.1	55.4	9.0	31.8	5.2
1955	657.5	61.3	9.3	35.9	5.5
1956	671.6	65.4	9.7	37.0	5.5
1957	683.8	66.2	9.7	37.8	5.5
1958	680.9	59.3	8.7	32.5	4.8
1959	721.7	63.6	8.8	36.2	5.0
1960	737.2	66.9	9.1	37.4	5.1
1961	756.6	66.7	8.8	36.5	4.8
1962	800.3	72.0	9.0	40.4	5.0
1963	832.5	75.1	9.0	43.1	5.2
1964	876.4	82.7	9.4	48.3	5.5
1965	929.3	97.4	10.5	56.8	6.1
1966	984.8	108.0	11.0	64.5	6.5
1967	1,011.4	105.6	10.4	63.6	6.2
1968	1,058.1	109.5	10.3	66.8	6.3
1969	1,087.6	116.8	10.7	71.8	6.6
1970	1,085.6	113.8	10.5	69.9	6.4
1971	1,122.4	112.2	9.2	69.3	5.7
1972	1,185.9	121.0	10.2	76.9	6.5
1973	1,255.0	138.1	11.0	90.7	7.2
1974	1,248.0	135.7	10.9	92.1	7.4
1975	1,233.9	119.3	9.7	81.1	6.6
1976(r)	1,298.2	125.6	9.7	86.1	6.6
1977(r)	1,369.7	140.3	10.2	99.9	7.3
1978(r)	1,438.6	158.3	11.0	113.7	7.9
1979(r)	1,479.4	169.9	11.5	120.8	8.2
1980(r)	1,474.0	166.1	11.3	117.6	8.0
1981(r)	1,502.6	172.0	11.4	120.4	8.0
1982	1,476.9	165.7	11.2	121.4	8.2

r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

U.S. BALANCE OF TRADE
1964 to Date

Year	All Merchandise Billions of Dollars			Machine Tools and Parts Millions of Dollars		
	Exports	Imports	Net Balance	Exports	Imports	Net Balance
1964	$ 25.5	$ 18.7	$ 6.8	$ 300.8	$ 45.6	$ 255.2
1965	26.5	21.5	5.0	287.2	68.9	218.3
1966	29.3	25.5	3.8	273.6	137.4	136.2
1967	30.7	26.9	3.8	294.5	203.7	90.8
1968	33.6	33.0	.6	286.0	191.3	94.7
1969	36.4	35.8	.6	323.5	182.5	140.9
1970	42.0	39.8	2.2	403.9	158.5	245.4
1971	42.8	45.5	−2.7	351.0	109.6	241.4
1972	48.8	55.8	−7.0	332.1	141.8	190.3
1973	71.4	70.4	1.0	443.0	211.6	231.4
1974	98.3	103.7	−5.4	566.5	330.3	236.2
1975	107.1	98.0	9.1	705.9	382.4	323.5
1976	114.4	123.4	−9.0	682.8	383.3	299.5
1977(r)	119.7	150.2	−30.5	579.6	482.2	97.4
1978(r)	140.9	174.5	−33.6	738.6	832.4	−93.7
1979(r)	179.2	209.4	−30.2	878.6	1,269.5	−390.9
1980(r)	220.1	244.0	−23.9	1,099.2	1,556.9	−457.7
1981(r)	231.9	260.1	−28.2	1,445.6	1,712.9	−267.3
1982(p)	209.4	244.8	−35.4	1,002.4	1,489.4	−487.0

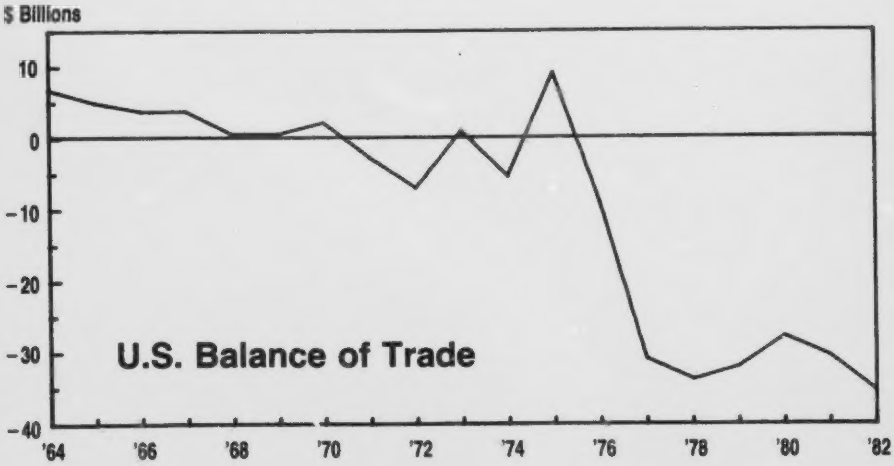
p - Preliminary. r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metal working machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Individual items may not add to totals due to rounding.

Source. All merchandise: U.S. Department of Commerce, "Survey of Current Business," (monthly); Machine Tools: U.S. Bureau of the Census, "EM 522" and "IM 146".

For details on how the values in the above table are computed, see the text introduction to Chapter 5.



VALUE OF U.S. DIRECT FOREIGN INVESTMENTS
Book Value at Year End, 1976 to 1981
(Millions of U.S. Dollars)

	1976	1977(r)	1978(r)	1979(r)	1980(r)	1981(p)
World:						
Total All Industries	$136,396	$145,990	$162,727	$187,858	$215,578	$227,342
Manufacturing	61,161	62,019	69,669	79,023	89,160	92,480
Canada:						
Total All Industries	33,932	35,052	36,396	40,662	44,978	46,957
Manufacturing	15,965	14,795	15,736	17,531	18,876	19,658
United Kingdom:						
Total All Industries	15,137	16,709	19,527	23,696	28,605	30,086
Manufacturing	7,734	8,310	9,483	11,447	13,893	13,357
European Economic Community:						
Total All Industries	26,445	32,441	36,464	42,379	48,797	50,406
Manufacturing	16,583	19,096	22,013	24,506	27,470	28,146
Other Western Europe:						
Total All Industries	13,556	13,401	14,656	16,981	19,137	20,826
Manufacturing	4,472	3,064	3,159	3,676	3,969	4,031
Japan:						
Total All Industries	3,797	4,593	5,406	6,180	6,243	6,807
Manufacturing	1,691	1,968	2,343	2,777	2,971	3,277
Australia, New Zealand, & South Africa:						
Total All Industries	7,530	7,923	8,781	9,579	10,590	12,030
Manufacturing	3,322	3,242	3,559	3,946	4,205	4,694
Latin America:						
Total All Industries	23,934	27,514	31,770	35,220	38,882	38,883
Manufacturing	9,275	9,614	11,153	12,440	14,550	15,762
Other Areas:						
Total All Industries	12,063	8,356	9,727	13,161	18,346	21,347
Manufacturing	2,121	1,931	2,224	2,700	3,225	3,554

p - Preliminary.   r - Revised.

Source: U.S. Department of Commerce, "Survey of Current Business," (August).

Direct foreign investments include purchases and sales of equity interest in foreign enterprises and captial movements between U.S. corporations and their foreign affiliates.

ESTIMATES OF CAPITAL EXPENDITURES* BY MAJORITY-OWNED FOREIGN AFFILIATES OF U.S. COMPANIES, BY SELECTED COUNTRY OR AREA

(Millions of U.S. Dollars)

	Actual						Projection	
	1976	1977	1978	1979	1980	1981(r)	1982(r)	1983
WORLD								
Total Manufacturing	$11,013	$10,522	$11,959	$15,419	$19,540	$19,164	$16,633	$17,206
Mchy., Except Elec.	2,660	2,968	3,630	4,749	5,589	5,106	4,160	4,442
CANADA								
Total Manufacturing	2,312	2,275	2,405	2,776	3,728	3,800	2,775	2,953
Mchy., Except Elec.	383	283	340	403	499	649	580	500
LATIN AMERICA								
Total Manufacturing	1,568	1,355	1,491	1,957	2,760	3,114	2,846	2,928
Mchy., Except Elec.	236	191	290	257	411	422	340	320
EUROPE								
Total Manufacturing	6,013	5,875	6,841	9,224	11,127	10,273	9,012	9,372
Mchy., Except Elec.	1,729	2,164	2,638	3,694	4,099	3,423	2,629	3,151
UNITED KINGDOM								
Total Manufacturing	1,513	1,447	1,780	2,596	3,005	2,591	2,505	2,598
Mchy., Except Elec.	516	455	527	834	784	735	550	680
FRANCE								
Total Manufacturing	829	1,041	1,072	1,273	1,582	1,316	1,006	1,361
Mchy., Except Elec.	326	571	620	790	977	821	520	710
FEDERAL REP. OF GERMANY								
Total Manufacturing	1,498	1,495	2,122	2,826	3,233	2,653	2,302	2,538
Mchy., Except Elec.	426	571	828	1,137	1,174	959	810	925
ITALY								
Total Manufacturing	506	418	522	634	870	797	635	785
Mchy., Except Elec.	214	D	D	D	D	D	330	D
ASIA AND PACIFIC								
Total Manufacturing	688	586	718	919	1,281	1,237	1,262	1,172
Mchy., Except Elec.	26(a)	22(a)	331	355	34(a)	47(a)	66(a)	3(a)
JAPAN								
Total Manufacturing	423	325	401	462	707	666	642	563
Mchy., Except Elec.	D	D	314	337	D	D	D	D
SOUTH AFRICA								
Total Manufacturing	92	67	61	87	117	147	218	197
Mchy., Except Elec.	D	D	8	11	18	19	20	18
AUSTRALIA								
Total Manufacturing	261	314	375	381	453	512	439	460
Mchy., Except Elec.	47	18	21	28	D	D	37	32

D - Withheld to avoid disclosure. r - Revised.

(a) Excludes Japan.

* - "Capital expenditures" previously were referred to as "property, plant, and equipment expenditures." They represent gross outlays charged to capital accounts to acquire, add to, or improve real property, plant, and equipment. Sales or other dispositions of fixed assets are not netted against these outlays.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

EXPENDITURES ON NEW PLANT AND EQUIPMENT

Major Industries, Selected Years, 1960 to Date

(Billions of Dollars)

Year	All Industries	Total Manufacturing Industries	Durable Goods Industries	Electrical Machinery and Equipment	Non-electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment
1960	$ 48.63	$ 16.36	$ 8.28	$ 1.02	$ 1.21	$ 1.48	$0.46
1965	70.44	25.41	13.49	1.68	2.24	3.00	0.74
1968	88.45	32.33	17.93	3.17	2.90	2.67	1.57
1969	99.53	36.27	19.97	3.27	3.63	2.99	1.81
1970	105.61	36.99	19.80	3.49	3.79	3.05	1.61
1971	108.52	33.60	16.78	3.04	3.15	2.42	1.13
1972	120.25	35.42	18.22	2.83	3.24	3.01	1.40
1973	137.69	42.37	22.74	3.50	3.97	3.83	1.83
1974	156.98	53.21	27.44	3.85	5.22	4.31	2.56
1975	157.71	54.92	26.33	3.14	4.96	3.35	2.57
1976	171.45	59.94	28.48	3.65	5.52	3.62	2.77
1977	198.08	69.23	34.05	4.68	6.59	5.83	3.22
1978	231.24	79.72	40.44	5.69	7.21	7.22	4.79
1979	270.45	98.68	51.07	7.28	10.52	8.31	7.01
1980	295.63	115.81	58.91	9.59	11.59	9.06	9.10
1981	321.49	126.79	61.84	10.31	13.22	10.08	8.31
1982(r)	316.43	119.68	56.44	10.62	12.89	7.92	7.24
1983E	310.92	115.90	54.22	10.97	13.12	8.05	6.51

E - Estimate. r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business," (monthly), Estimate, "Survey of Current Business," (March).

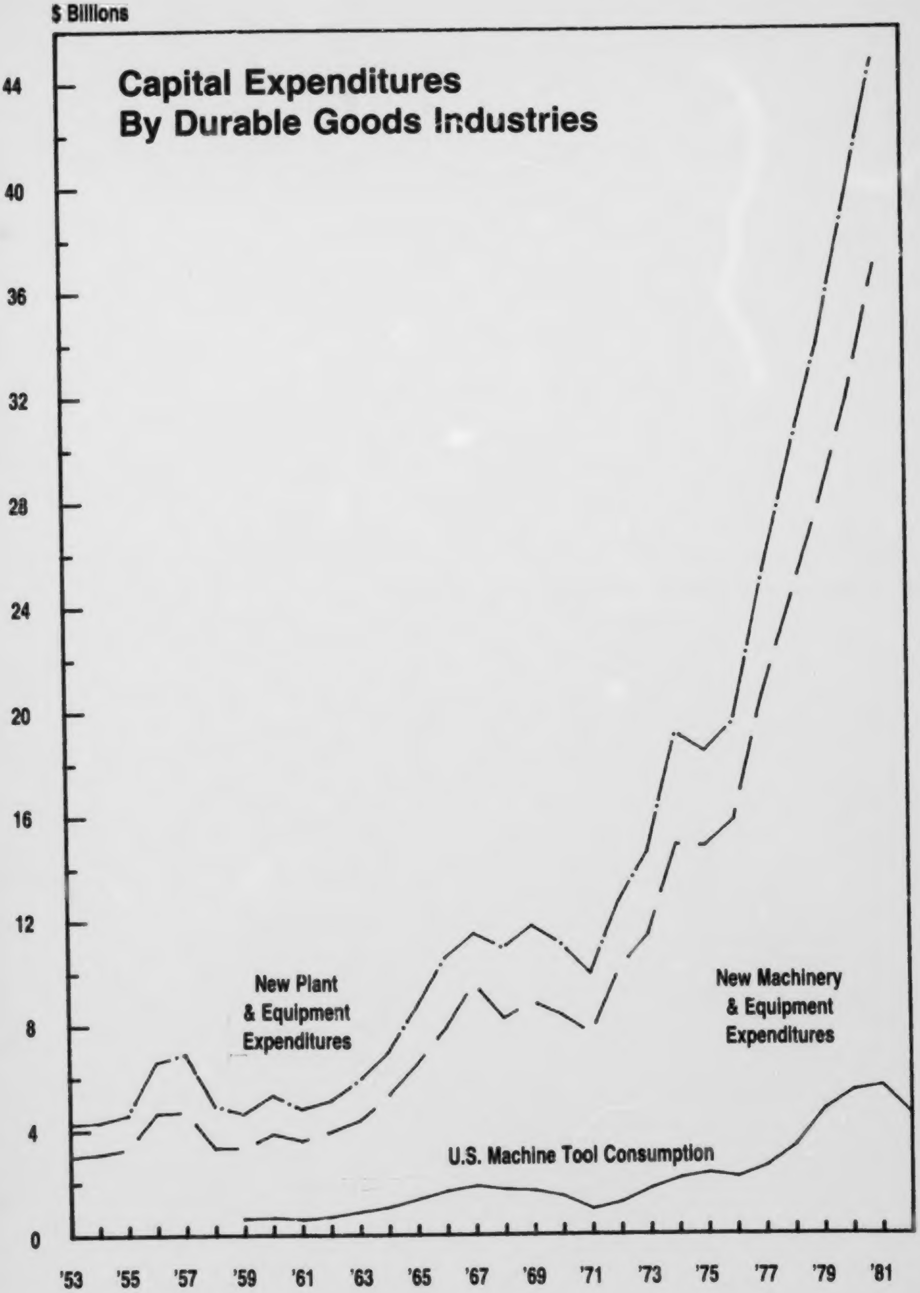
NEW PLANT AND EQUIPMENT PROJECTS

Starts During Year and Carry-Over at Year End, 1965 to Date

(Billions of Dollars)

	Total Manufacturing		Durables		Electrical Machinery		Nonelectrical Machinery		Transportation Equipment		Public Utilities	
Year	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over
1965	$ 31.12	$20.02	$17.14	$11.00	$ 2.32	$1.64	$ 2.75	$1.04	$ 4.82	$ 3.07	$ 8.82	$ 7.67
1967	30.31	20.96	16.10	12.07	3.05	2.51	2.70	1.08	3.87	2.67	13.53	14.12
1968	33.81	22.44	18.43	12.57	2.91	2.26	2.81	.99	4.90	3.32	12.68	16.28
1969	39.80	25.97	21.65	14.25	4.59	3.58	3.82	1.18	4.86	3.38	14.85	19.43
1970	33.82	22.81	17.41	11.86	2.91	2.99	3.66	1.06	4.12	2.85	16.76	23.16
1971	31.78	20.99	15.86	10.93	2.35	2.31	2.98	.89	3.78	3.09	20.69	29.15
1972	38.97	24.54	19.30	12.01	2.63	2.10	3.39	1.04	4.74	3.42	29.77	42.65
1973	53.21	35.38	28.07	17.33	4.12	2.72	4.43	1.50	7.02	4.79	36.22	60.91
1974	61.24	43.41	31.07	21.59	3.55	2.42	6.20	2.47	7.11	5.03	47.72	88.79
1975	56.51	45.00	23.71	18.98	2.59	1.88	5.33	2.84	4.40	3.52	39.32	108.14
1976	59.38	44.44	29.80	20.30	4.27	2.49	6.20	3.52	6.64	3.77	28.09	113.86
1977	77.40	52.62	36.59	22.85	4.80	2.62	6.84	3.77	10.63	5.33	34.53	121.60
1978	88.16	61.05	46.20	28.62	6.27	3.20	7.71	4.27	15.62	8.94	38.74	130.39
1979	112.98	75.35	59.18	36.72	8.16	4.08	12.66	6.41	19.01	12.63	21.67	118.10
1980	123.32	85.16	57.67	36.92	10.25	5.11	10.72	5.81	16.50	11.42	43.69	130.16
1981	135.19	93.73	68.89	44.37	11.50	6.49	15.95	8.75	19.35	12.26	34.98	126.04
1982	104.78	79.05	46.06	33.41	9.09	4.73	11.11	6.79	13.89	10.97	15.77	100.48

Source: U.S. Department of Commerce, "Survey of Current Business" (March).



Source: U.S. Bureau of Census & NMTBA

EXPENDITURES ON NEW PLANT AND EQUIPMENT BY DURABLE GOODS INDUSTRIES AND MACHINE TOOL CONSUMPTION

1953 to Date

	New Plant & Equipment Expenditures Billions of Dollars				U.S. Machine Tool Consumption (c) (Mil. Dollars)	Machine Tool Consumption As a % of		
	BEA (a)	Census (b)				BEA (a)	Census (b)	
Year	Total	Total	Plant	Equipment		Total	Total	Equipment
1953	$ 5.31	$ 4.26	$1.25	$ 3.01	NA	NA	NA	NA
1954	4.91	4.32	1.20	3.12	NA	NA	NA	NA
1955	5.41	4.59	1.28	3.31	NA	NA	NA	NA
1956	7.45	6.62	1.55	4.67	NA	NA	NA	NA
1957	7.84	6.94	2.20	4.74	NA	NA	NA	NA
1958	5.61	4.94	1.33	3.61	NA	NA	NA	NA
1959	6.73	4.64	1.29	3.35	$ 631.2	9.4%	13.6%	18.8%
1960	8.28	5.34	1.47	3.87	655.9	7.9	12.3	16.9
1961	7.42	4.81	1.21	3.60	589.7	7.9	12.3	16.4
1962	7.81	5.12E	1.17E	3.95E	688.7	8.8	13.5	17.4
1963	8.64	5.92	1.55	4.37	867.8	10.0	14.7	19.9
1964	10.99	6.95	1.64	5.31	1,046.8	9.5	15.1	19.7
1965	13.49	8.70	2.18	6.52	1,342.7	10.0	15.4	20.6
1966	17.23	10.61E	2.72E	7.89E	1,657.4	9.6	15.6	21.0
1967	17.82	11.52	1.92	9.60	1,853.3	10.4	16.1	19.3
1968	17.93	10.97	2.71	8.26	1,711.8	9.5	15.6	20.7
1969	19.97	11.81	2.90	8.91	1,666.8	8.3	14.1	18.7
1970	19.80	11.11	2.74	8.37	1,444.8	7.3	13.0	17.3
1971	16.78	9.96	2.34	7.62	957.0	5.7	9.6	12.6
1972	18.22	12.70	2.56	10.14	1,212.2	6.7	9.5	12.0
1973	22.74	14.58	3.15	11.43	1,730.3	7.6	11.9	15.1
1974	27.44	19.13	4.26	14.87	2,126.4	7.8	11.1	14.3
1975	26.33	18.42	3.60	14.82	2,300.1	8.[illegible]	12.5	15.5
1976(r)	28.48	19.57	3.75	15.82	2,144.3	7.[illegible]	11.0	13.6
1977	34.05	24.93	4.41	20.52	2,562.5	7.5	10.3	12.5
1978(r)	40.44	29.66	5.52	24.14	3,348.6	8.3	11.3	13.9
1979(r)	51.07	33.91	6.22	27.69	4,722.3	9.2	13.9	17.1
1980(r)	58.91	39.42	7.62	31.80	5,441 4	9.2	13.8	17.1
1981(r)	61.84	44.75	7.83	36.91	5,867.8	9.5	13.1	15.9
1982	56.44	NA	NA	NA	4,535.4	8.0	NA	NA

NA - Not Available. E - Estimate. r - Revised.

(a) Bureau of Economic Analysis: covers all establishments (Manufacturing and Nonmanufacturing) operated by Manufacturing companies.

(b) Bureau of the Census: covers all Manufacturing establishments.

(c) U.S. domestic machine tool shipments plus imports.

Source: Bureau of Economic Analysis, U.S. Department of Commerce, "Survey of Current Business;" Bureau of the Census, "Annual Survey of Manufactures," M(AS)-5, Expenditures for New Plant and New Equipment; U.S. Bureau of the Census, "FT 135" and earlier reports; and National Machine Tool Builders' Association.

The last three columns in the above table show the percentage of investment for machine tools has declined since the 1960's. The U.S. share of machine tool investment has declined even more because imports have increased their share of the U.S. machine tool market. See the table in the beginning of chapter 5 on machine tool imports as a percentage of U.S. consumption.

EXPENDITURES FOR NEW MACHINERY AND EQUIPMENT
By Major Machine Tool Consuming Industries, 1947 to Date
(Millions of Dollars)

Year	Durable Goods Industries	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles & Equipment (a)	Aircraft & Parts
1947	NA	$ 212.7	$ 312.5	$ 179.7	$ 75.5	$ 18.8
1948	NA	NA	NA	NA	NA	NA
1949	NA	167.8	214.5	133.5	147.9	27.2
1950	NA	223.9	213.0	145.4	216.0	S
1951	NA	246.0	348.5	192.7	290.5	79.7
1952	NA	238.9	342.5	215.9	270.5	77.9
1953	$ 3,010	288.9	404.1	258.8	406.9	83.4
1954	3,120	323.2	425.5	247.6	621.0	87.8
1955	3,309	335.0	440.6	262.3	484.9	115.7
1956	4,669	361.1	545.3	342.3	854.9	181.4
1957	4,740	398.2	553.6	348.4	581.0	209.7
1958	3,605	316.8	487.0	311.1	271.0	129.2
1959	3,350	357.4	399.6	375.2	310.5	128.3
1960	3,866	360.4	435.1	449.0	371.0	124.4
1961	3,600	314.3	416.6	424.0	319.4	149.7
1962	3,946	390.2	447.8	476.4	366.4	189.4
1963	4,366	460.1	612.1	525.9	510.4	191.8
1964	5,306	549.4	713.3	568.2	712.0	204.6
1965	6,520	612.0	960.3	810.5	889.9	206.3
1966	7,889	725.6	1,157.2	1,019.6	893.9	414.7
1967	9,595	834.2	1,361.5	1,087.9	643.0	546.6
1968	8,256	799.5	1,299.8	1,061.3	632.0	463.8
1969	8,905	951.9	1,449.7	1,239.2	781.2	479.0
1970	8,365	872.0	1,377.3	1,134.6	731.7	292.9
1971	7,619	808.6	1,292.7	1,081.1	620.4	197.5
1972	10,139	1,030.7	1,478.2	1,123.4	1,921.3	139.8
1973	11,432	1,345.4	1,791.2	1,567.9	1,625.3	197.6
1974	14,868	1,470.4	2,456.8	1,899.9	2,087.5	227.6
1975	14,821	1,628.9	2,571.6	1,519.1	1,653.6	286.7
1976	15,822	1,724.8	2,611.1	1,816.5	1,908.1	350.6
1977	20,525	2,280.8	3,502.5	2,360.2	3,195.4	417.5
1978	24,142	2,494.4	4,427.7	2,937.9	3,968.6	575.1
1979	27,689	2,741.6	5,326.0	3,650.3	4,243.4	936.4
1980	31,803	3,219.8	6,086.1	4,780.1	4,752.6	1,262.7
1981	36,912	3,791.8	7,040.1	5,098.1	7,539.0	1,325.4

NA - Not Available. S - Estimate did not meet publication standards.

(a) Beginning in 1972, expenditures for special automotive tools (such as dies, die sets, jigs, fixtures, etc.) are included as capital expenditures. For transition information, special tooling expenditures amount to $1.2 billion for 1972 and $840 million for 1973.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures, M(AS)-5, Expenditures for New Plant and New Equipment".

CAPITAL FORMATION IN MANUFACTURING INDUSTRIES
Selected Years, 1950 to Date
(Billions of Dollars)

Year	Purchases		Depreciation (a)		Net Investment (b)		Net Value (c)	
	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment
In Current Dollars								
1950	$ 6.1	$ 4.3	$ 4.7	$ 3.0	$ 1.4	$ 1.3	$ 55.1	$ 26.4
1955	9.3	6.3	7.3	5.0	2.0	1.3	77.0	41.0
1960	10.8	7.8	10.0	7.3	.8	.5	95.6	54.7
1965	18.3	13.8	12.0	8.8	6.3	5.0	116.4	68.2
1969	23.8	17.4	17.3	12.9	6.5	4.5	175.7	103.7
1970	23.8	17.5	18.9	14.0	4.9	3.5	191.2	112.3
1971	22.5	16.6	20.3	14.9	2.2	1.7	201.3	117.7
1972	25.8	19.9	21.4	15.7	4.4	4.2	213.4	124.0
1973	29.0	22.4	23.0	16.7	6.0	5.7	236.1	136.0
1974	38.3	29.3	26.5	19.0	11.8	10.3	292.7	170.4
1975	39.8	31.6	31.6	23.3	8.2	8.3	319.3	198.2
1976	43.4	34.7	34.5	26.1	8.9	8.6	343.9	219.0
1977	51.2	41.8	38.5	29.5	12.7	12.3	387.3	248.8
1978(r)	58.2	46.6	43.2	33.2	15.0	13.4	438.2	281.0
1979(r)	74.1	58.9	50.1	38.5	24.0	20.4	508.8	328.1
1980(r)	86.9	69.8	58.5	45.1	28.4	24.7	586.3	383.8
1981(r)	96.4	77.4	67.2	52.8	29.2	24.6	663.8	445.3
1982	93.6	73.9	74.4	59.3	19.2	14.6	669.5	473.9
In 1972 Dollars								
1950	$12.4	$ 8.2	$ 9.5	$ 5.9	$ 2.9	$ 2.3	$106.4	$ 50.2
1955	16.6	10.2	12.2	8.2	4.4	2.0	127.1	64.6
1960	15.6	10.3	14.1	9.6	1.5	.7	140.4	71.9
1965	24.5	17.3	15.9	11.1	8.6	6.2	158.1	84.8
1969	27.5	19.3	19.7	14.2	7.8	5.1	196.7	111.9
1970	25.9	18.5	20.4	14.8	5.5	3.7	202.2	115.8
1971	23.1	16.9	20.9	15.2	2.2	1.7	204.6	117.8
1972	25.8	19.9	21.4	15.7	4.4	4.2	209.2	122.2
1973	27.9	21.8	22.1	16.3	5.8	5.5	215.3	128.0
1974	33.4	26.3	23.0	17.1	10.4	9.2	225.9	137.4
1975	30.4	24.5	24.0	18.0	6.4	6.5	232.7	144.3
1976	31.6	25.3	25.0	19.0	6.6	6.3	239.7	151.1
1977	35.3	28.9	26.2	20.1	9.1	8.8	249.2	160.3
1978(r)	37.6	30.5	27.6	21.5	10.0	9.0	259.5	169.7
1979(r)	44.5	36.4	29.4	23.1	15.1	13.3	275.1	183.3
1980(r)	49.8	41.6	31.7	25.3	18.1	16.3	293.6	200.1
1981(r)	51.9	43.4	34.3	27.8	17.6	15.6	311.8	216.1
1982	49.3	40.7	36.9	30.3	12.4	10.4	324.8	227.1

r - Revised.

(a) Straight-line depreciation.
(b) Represents the difference between the purchase and depreciation series.
(c) Represents net value in preceding year plus net investment based on straight-line depreciation for year shown.
(d) Total includes equipment and structures.

Source: U.S. Bureau of Economic Analysis.

Data refer to privately owned manufacturing industries and are based on the fixed capital formation components of the gross national product. Stocks are as of end of year; investment and depreciation are annual totals.

CAPITAL APPROPRIATIONS AND BACKLOG OF UNSPENT APPROPRIATIONS (a)

By Selected Industry Groups, 1960 to Date

	All Manufacturing		Durables		Non-Electrical Machinery	
Year	Approp.	Backlog	Approp.	Backlog	Approp.	Backlog
In Current Dollars (Billions)						
1960	$ 10.5	$ 8.4	$ 4.5	$ 4.6	$ 0.7	$0.9
1961	10.1	8.1	4.0	4.1	0.8	1.0
1962	11.7	8.5	5.4	4.5	0.8	0.9
1963	13.3	10.5	6.4	5.6	0.9	1.0
1964	17.9	14.0	8.7	7.2	1.4	1.1
1965	22.3	17.9	11.6	9.4	2.1	1.3
1966	25.4	20.2	14.0	11.4	2.8	1.5
1967	23.9	19.9	12.0	11.0	2.5	1.4
1968	24.8	20.9	12.6	11.5	2.4	1.3
1969	29.5	23.4	15.0	12.4	3.0	1.3
1970	25.3	20.9	12.4	10.8	3.1	1.2
1971	23.1	18.9	11.2	9.4	2.7	1.3
1972	28.8	23.3	14.1	11.8	3.2	1.8
1973	42.9	37.1	21.6	18.7	4.3	2.6
1974	53.7	49.8	24.9	22.7	5.8	3.8
1975	45.0	46.4	16.2	18.1	3.7	3.5
1976	50.0	47.5	22.4	21.0	5.0	4.0
1977	63.4	56.5	26.6	24.6	5.1	4.2
1978	67.2	63.4	33.1	31.1	6.3	5.0
1979	88.5	76.7*	43.3	39.0*	10.2	7.0*
1980	104.6	90.7*	44.3	40.8*	9.4	6.5*
1981(r)	107.0	92.7*	42.1	39.8*	12.7	8.6*
1982(p)	87.5	70.4*	32.0	27.1*	8.7	5.5*
In Constant 1972 Dollars (Billions)						
1960	$ 14.6	$14.2	$ 6.0	$ 7.9	$ 1.0	$1.3
1961	14.2	13.8	5.4	7.2	1.1	1.4
1962	16.1	14.4	7.3	7.8	1.1	1.4
1963	18.2	17.1	8.5	9.2	1.2	1.4
1964	24.3	21.8	11.6	11.3	1.8	1.6
1965	29.6	27.1	15.2	14.3	2.7	1.8
1966	32.8	30.0	17.7	16.8	3.5	2.1
1967	30.0	29.6	14.8	16.3	3.1	1.9
1968	29.6	30.8	14.9	16.9	2.8	1.8
1969	33.6	33.7	17.0	17.9	3.4	1.8
1970	27.5	31.0	13.5	16.2	3.4	1.8
1971	23.9	28.9	11.5	14.8	2.8	1.9
1972	28.8	33.3	14.1	17.2	3.2	2.3
1973	41.6	46.7	21.0	23.9	4.1	3.1
1974	47.4	58.0	22.2	27.5	5.1	4.2
1975	34.6	55.3	12.8	23.9	2.9	3.9
1976	36.5	56.1	16.4	26.1	3.7	4.3
1977	43.7	62.3	18.5	28.6	3.6	4.4
1978	43.2	66.8	21.3	32.8	4.1	4.9
1979	52.5	74.7*	26.0	37.6*	6.2	6.1*
1980	58.3	82.5*	24.8	38.6*	5.3	5.9*
1981(r)	55.0	83.6*	22.4	38.1*	6.7	7.0*
1981(p)	43.4	72.3*	16.3	31.7*	4.3	5.5*

p - Preliminary estimate. r - Revised. * - Seasonally adjusted.

(a) These data are the results of The Conference Board's survey of the 1,000 largest U.S. manufacturers and pertain only to their domestic capital investment. This series is copyrighted by The Conference Board and can be reproduced only with their written permission.

Source: The Conference Board.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Selected Industry Groups, 1979 to Date

(Millions of Dollars)

	1979		1980		1981	
Industry Group	Total	Machinery & Equipment	Total	Machinery & Equipment	Total	Machinery & Equipment
All Operating Manufacturing Establishments	$522,560	$393,645	$573,570	$433,995	$630,438	$479,233
Fabricated Metal Products	30,811	22,943	33,721	25,369	36,363	27,416
Nonelectrical Machinery	46,263	33,471	52,662	38,324	59,740	43,580
Construction & Related Machinery	8,720	5,911	9,864	6,747	11,226	7,754
Metalworking Machinery	5,865	4,451	6,546	4,996	7,269	5,552
Metal Cutting Machine Tools	1,333	961	1,453	1,036	1,627	1,164
Metal Forming Machine Tools	566	406	612	444	636	456
Other Metalworking Machinery	3,966	3,084	4,481	3,516	5,007	3,932
Special Industrial Machinery	3,130	2,146	3,458	2,395	3,793	2,638
General Industrial Machinery	6,544	4,828	7,378	5,490	8,191	6,106
Office & Computing Machines	6,750	4,742	8,319	5,895	10,006	7,023
Other Nonelectrical Machinery	15,254	11,393	17,097	12,801	9,914	7,569
Electrical Machinery	30,340	21,626	35,278	25,340	40,430	29,051
Transportation Equipment	40,326	28,762	45,636	32,814	53,361	39,437
Instruments & Related Products	10,377	6,897	11,825	7,941	13,360	9,051

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, 1977 "Census of Manufactures," "Annual Survey of Manufactures."

The tables appearing on this and the following page are included to provide some measure of the total stock of fixed assets in selected machine tool consuming industries. However, neither table presents an ideal measurement. Data in the "Gross Book Value" table include the total original cost of assets until the time they are fully depreciated. These are available only on an annual basis. The "Net Value" table is more current and is available on a quarterly basis but includes land, mineral rights, depletion, and amortization.

The data in the tables are not directly comparable due to these definitional differences in sample coverage and statistical methodology. For additional information on the gross book value of depreciable assets in the machine tool industry, see chapter 8.

NET VALUE OF PROPERTY, PLANT AND EQUIPMENT (a)

Selected Industry Groups, 1974 to Date

(Millions of Dollar)

Year: Qtr.	All Manufacturing	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Transportation Equipment	Instruments and Related Products
1974:1	$237,598	$9,688	$16,556	$15,520	$19,074	$ 5,024
:2	245,053	10,048	17,198	15,798	19,582	5,319
:3	252,095	9,914	17,915	16,118	20,283	5,503
:4	262,142	10,428	21,457	14,620	20,617	6,095
1975:1	266,114	10,487	21,884	14,854	21,529	6,480
:2	273,796	10,865	22,541	15,035	22,382	6,645
:3	278,565	10,751	22,854	15,157	22,557	6,659
:4	283,689	10,816	23,018	14,977	22,515	6,919
1976:1	287,362	11,160	23,342	15,001	21,669	6,938
:2	293,435	11,149	23,786	15,155	21,673	6,990
:3	300,895	11,363	23,967	15,246	21,924	7,138
:4	307,360	11,469	24,745	15,452	21,927	7,210
1977:1	310,962	11,443	25,206	15,780	21,808	7,240
:2	318,941	11,797	25,940	15,735	22,513	7,417
:3	327,798	12,144	26,635	16,366	23,317	7,406
:4	339,809	12,286	27,805	17,051	24,369	7,555
1978:1	348,397	12,301	28,893	17,063	24,874	7,828
:2	357,773	12,720	29,803	17,551	26,074	7,820
:3	367,736	13,450	30,849	18,179	27,331	7,896
:4	382,953	14,208	32,168	19,175	28,883	8,162
1979:1(r)	393,630	14,681	33,204	19,480	29,982	8,343
:2(r)	405,188	15,213	34,931	20,048	31,289	8,631
:3(r)	418,836	15,556	36,345	20,925	32,857	8,925
:4	441,415	15,597	39,093	22,222	34,130	9,447
1980:1(r)	455,115	15,871	41,330	22,360	35,514	9,549
:2(r)	468,348	16,309	42,619	23,204	36,913	9,826
:3(r)	487,080	16,569	44,381	24,323	38,312	10,253
:4	515,022	18,607	46,718	26,186	39,861	10,761
1981:1(r)	529,406	18,886	47,618	27,048	41,440	11,101
:2(r)	547,707	19,391	49,446	28,072	42,533	11,491
:3(r)	565,901	19,493	51,334	29,106	43,911	11,837
:4(r)	586,077	19,846	54,078	30,817	44,746	12,425
1982:1	604,415	20,269	55,103	30,912	45,858	12,771
:2	618,376	20,952	56,950	31,808	46,481	13,047
:3	631,131	21,172	58,678	32,913	47,362	13,579
:4(p)	643,365	21,525	58,863	33,630	49,124	14,027

p - Preliminary. r - Revised.

(a) Depreciable fixed assets including construction in progress, land and mineral rights less accumulated depreciation, depletion and amortization.

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

Net Value of Property, Plant and Equipment data are collected quarterly by extensive survey of manufacturing, mining and trade corporations. Each corporation is required to show gross receipts by source industry and is classified in the particular industry which accounts for the largest share of gross receipts. Please note that these procedures may lead to a conglomerate corporation being assigned to an industry from which only a small proportion of its receipts are obtained. For this reason, the above data should be used with caution.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS

Short-term Rates, 1968 to Date

(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1968	6.68%	6.36%	6.84%	6.89%	6.61%
1969	8.21	7.32	7.86	8.82	8.83
1970	8.48	8.86	8.49	8.50	8.07
1971(a)	6.48	6.59	6.01	6.51	6.18
1972	5.82	5.52	5.59	5.84	6.33
1973	8.30	6.52	7.35	9.24	10.08
1974	11.28	9.91	11.15	12.40	11.64
1975	8.65	9.94	8.16	8.22	8.29
1976	7.52	7.54	7.44	7.80	7.28
1977	7.85	7.48	7.37	7.87	8.66
1978	9.84	8.95	9.01	9.97	11.44
1979	13.18	12.27	12.34	12.31	15.81
1980	15.17	15.67	17.75	11.56	15.7
1981	19.56	19.91	19.99	21.11	17.23
1982	14.69	17.13	17.11	13.27	11.26

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .16% decrease from 6.75% to 6.59%.

Source: Federal Reserve Board.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS

Long-term Rates, 1968 to Date

(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1968	6.73%	6.35%	6.73%	7.03%	6.79%
1969	8.01	6.64	7.87	8.66	8.86
1970	8.47	8.67	8.25	8.66	8.31
1971(a)	6.57	6.82	6.36	6.67	6.44
1972	6.12	5.64	5.87	6.31	6.67
1973	8.83	7.12	7.67	9.85	10.68
1974	11.70	10.16	11.41	13.08	12.16
1975	9.06	10.26	8.22	8.89	8.88
1976	7.99	8.02	8.02	8.45	7.48
1977	8.52	9.05	8.24	8.09	8.71
1978	10.11	9.19	9.67	10.20	11.38
1979	12.98	12.01	12.08	12.25	15.56
1980	15.32	15.79	18.37	12.06	15.07
1981	19.52	19.26	19.25	20.62	18.94
1982	15.25	16.59	16.96	15.22	12.24

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .08% decrease from 6.90% to 6.82%.

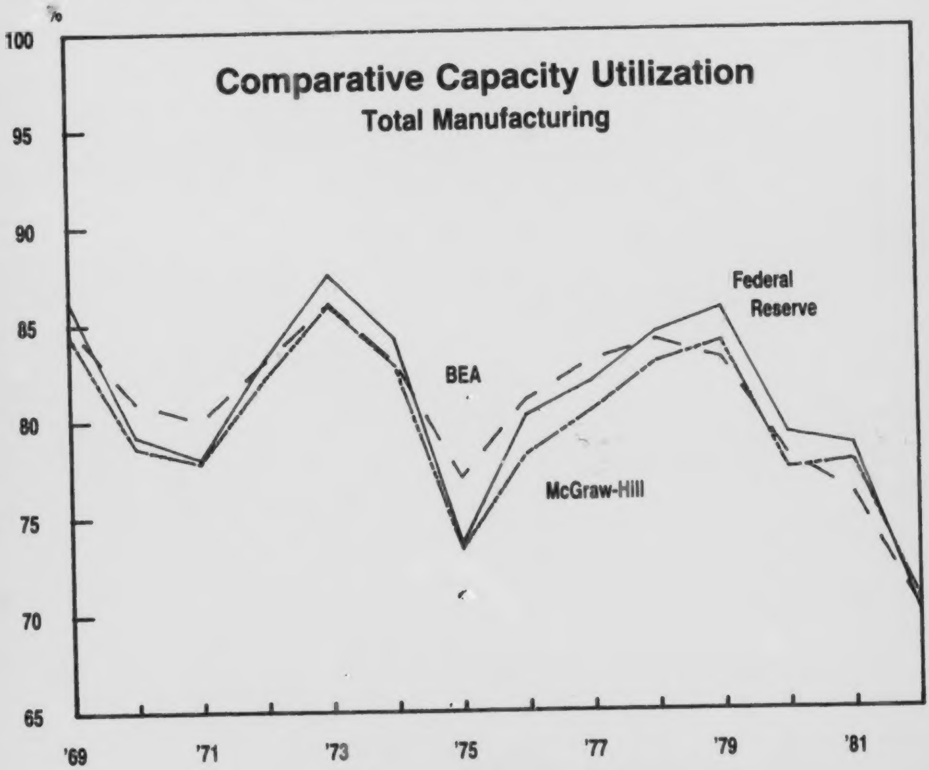
Source: Federal Reserve Board.

COMPARATIVE CAPACITY UTILIZATION MEASURES
Total Manufacturing, 1968 to Date

Year	Federal Reserve Board	Bureau of Economic Analysis	McGraw-Hill
1968	87.0%	85%	85.5%
1969	86.2	85	84.5
1970	79.2	81	78.6
1971	78.0	80	77.6
1972	83.1	83	82.1
1973	87.5	86	85.9
1974	84.2	83	82.8
1975	73.6	77	73.3
1976	80.2	81	78.2
1977	81.9	83	80.4
1978	84.4	84	82.9
1979	85.6	83	83.9
1980	79.1	78	77.3
1981	78.5	76	77.7
1982	69.8	70	70.5

Sources: Federal Reserve Board; U.S. Department of Commerce, Bureau of Economic Analysis; McGraw-Hill Publications Company.

For further explanation of "Capacity Utilization" see chapter introduction.



CAPACITY UTILIZATION IN MANUFACTURING
Bureau of Economic Analysis, Operating Rates
1965 to Date

	Total Mfg.	Total Durables	Electrical Machinery	Machinery, Except Electrical	Motor Vehicles	Aircraft	Advanced-Processed Goods (a)
1965	86%	88%	83%	95%	96%	79%	85%
1966	86	87	84	95	90	82	85
1967	84	83	78	91	87	82	83
1968	85	84	80	90	93	82	84
1969	85	84	80	92	90	77	84
1970	81	78	76	86	81	68	79
1971	80	78	76	81	92	65	80
1972	83	82	81	84	97	69	82
1973	86	85	82	87	100	69	84
1974	83	82	83	88	83	71	82
1975	77	76	73	83	83	65	77
1976	81	81	80	86	93	65	81
1977	83	84	82	89	99	68	83
1978	84	84	83	91	95	70	84
1979	83	83	82	91	84	76	82
1980	78	77	80	90	67	79	78
1981	76	75	76	89	63	75	76
1982	70	67	72	81	61	69	72
1978 1st Qtr. (b)	84	84	84	91	98	67	84
2nd Qtr. (b)	84	85	83	91	97	70	84
3rd Qtr. (b)	83	83	82	90	90	69	82
4th Qtr. (b)	84	85	82	92	96	72	84
1979 1st Qtr. (b)	84	85	84	92	96	74	84
2nd Qtr. (b)	83	84	82	92	89	75	83
3rd Qtr. (b)	82	82	82	91	78	77	81
4th Qtr. (b)	81	80	81	89	72	77	80
1980 1st Qtr. (b)	80	80	82	91	70	79	80
2nd Qtr. (b)	76	74	78	89	60	78	76
3rd Qtr. (b)	76	75	79	89	67	78	77
4th Qtr. (b)	78	78	79	90	70	80	78
1981 1st Qtr. (b)	78	77	78	89	69	77	78
2nd Qtr. (b)	78	77	76	90	73	75	78
3rd Qtr. (b)	76	74	76	89	60	75	76
4th Qtr. (b)	72	70	74	88	51	73	73
1982 1st Qtr. (b)	72	70	73	85	61	71	73
2nd Qtr. (b)	71	68	72	82	67	70	74
3rd Qtr. (b)	69	65	71	79	58	69	71
4th Qtr. (b)	68	63	71	76	56	67	69
1983 1st Qtr. (b)	70	66	71	75	63	66	71

(a) Advanced-Processed Goods include producers of furniture, electrical machinery, machinery except electrical, motor vehicles, aircraft, other transportation equipment, instruments, miscellaneous manufactures, food including beverages, tobacco, apparel, printing and publishing, chemicals (at ½ weight), and leather.

(b) Seasonally Adjusted.

Source: U.S. Department of Commerce, "Survey of Current Business," July 1974 and issues for March, June, September and December of later years.

CAPACITY UTILIZATION IN MANUFACTURING
McGraw-Hill, Operating Rates, Seasonally Adjusted
1966 to Date

Year	Total Mfg.	Total Durables	Metal-Working Industries	Fabricated Metals	Electrical Machinery	Machinery, except Electrical	Motor Vehicles and Parts
1966	89.1%	90.1%	91.6%	89.6%	92.0%	92.4%	92.8%
1967	85.4	84.9	86.6	86.6	86.3	87.3	79.3
1968	85.5	84.7	85.9	84.7	83.3	85.4	93.0
1969	84.5	84.0	84.3	81.4	78.0	87.9	94.3
1970	78.6	75.1	73.3	72.5	67.3	79.6	74.0
1971	77.8	73.5	71.5	69.8	65.2	72.2	93.9
1972	82.1	78.7	76.8	72.6	70.9	77.5	103.5
1973	85.9	84.7	83.2	78.6	79.8	84.1	104.8
1974	82.8	80.9	79.6	78.5	78.6	84.1	76.7
1975	73.3	69.4	69.2	71.7	64.6	72.3	64.6
1976	78.2	75.0	74.2	77.8	73.2	75.0	76.1
1977	80.4	78.2	78.1	78.5	78.1	77.0	87.0
1978	82.9	81.5	81.4	81.8	82.0	81.1	85.5
1979	83.9	83.0	83.6	84.8	84.1	85.6	78.5
1980	77.3	74.6	76.1	75.3	76.6	81.3	59.3
1981	77.7	75.3	75.6	77.8	79.7	80.6	62.7
1982	70.5	66.0	67.7	65.1	74.0	68.0	59.1
1978 1st Qtr.	81.3	79.2	79.7	79.7	80.5	79.8	82.2
2nd Qtr.	82.7	81.0	81.2	81.0	82.0	80.5	87.2
3rd Qtr.	83.3	82.2	82.0	82.7	82.7	81.8	85.0
4th Qtr.	84.2	83.5	82.8	83.8	82.7	82.5	87.7
1979 1st Qtr.	84.7	84.3	84.7	86.0	84.8	85.3	85.5
2nd Qtr.	84.0	83.5	84.0	85.5	84.0	85.7	81.8
3rd Qtr.	84.2	83.0	83.0	84.2	83.3	86.5	74.8
4th Qtr.	82.8	81.3	82.7	83.5	84.5	85.0	71.8
1980 1st Qtr.	82.3	80.8	81.5	81.9	82.9	86.2	65.3
2nd Qtr.	76.3	73.5	75.5	74.7	77.0	81.4	54.6
3rd Qtr.	73.7	70.0	72.5	70.1	72.8	78.4	54.2
4th Qtr.	76.9	74.2	74.9	74.3	73.7	79.2	63.0
1981 1st Qtr.	78.6	76.2	75.8	79.7	79.0	81.4	60.9
2nd Qtr.	78.8	76.8	77.2	79.7	80.3	81.7	68.6
3rd Qtr.	78.8	76.5	76.7	78.8	81.0	82.0	64.7
4th Qtr.	74.6	71.5	72.6	73.0	78.4	77.1	56.7
1982 1st Qtr.(r)	71.9	68.1	69.2	68.0	76.1	72.5	52.7
2nd Qtr.	70.9	67.0	69.0	65.9	75.4	68.8	63.4
3rd Qtr.	70.5	66.0	67.8	64.8	73.5	66.8	64.0
4th Qtr.	68.6	63.0	64.9	61.5	71.2	63.9	56.1
1983 1st Qtr.	70.7	65.6	66.0	63.2	72.3	62.8	64.2

r - Revised.

Source: McGraw-Hill Publications Company.

INDUSTRIAL PRODUCTION INDEXES
Major and Selected Industry Groupings, 1961 to Date
1967 = 100 (Quantity of Output Basis)

Year	Total Industrial Production	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nonelectrical Machinery
1961	66.7	65.6	61.8	71.1	69.4	55.4
1962	72.2	71.5	68.6	76.3	75.4	62.1
1963	76.5	75.8	73.1	82.3	77.8	66.3
1964	81.7	81.0	78.3	92.8	82.6	75.6
1965	89.8	89.7	89.0	102.1	90.8	85.0
1966	97.8	97.9	98.9	108.4	97.2	98.8
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	106.3	106.4	106.5	104.3	106.6	101.8
1969	111.1	111.0	110.6	113.8	107.9	109.3
1970	107.8	106.4	102.3	106.6	102.4	104.4
1971	109.6	108.2	102.4	100.2	103.5	100.2
1972	119.7	118.9	113.7	112.1	112.1	116.0
1973	129.8	129.8	127.1	126.7	124.7	133.7
1974	129.3	129.4	125.7	123.1	124.2	140.1
1975	117.8	116.3	109.3	96.4	109.9	125.1
1976	129.8	129.5	121.7	108.9	123.3	135.0
1977	137.1	137.1	129.5	110.2	130.9	144.8
1978	146.1	146.7	139.7	119.9	141.6	153.6
1979	152.5	153.6	146.4	121.3	148.5	163.7
1980	147.0	146.7	136.7	102.3	134.1	162.8
1981	151.0	150.4	140.5	107.9	136.4	171.2
1982	138.6	137.6	125.0	75.3	114.8	149.0

Source: Federal Reserve Board.

INDUSTRIAL PRODUCTION INDEXES
(Continued)

Year	Electrical Machinery	Transportation Equipment	Motor Vehicles and Parts	Aircraft and Parts	Instruments
1961	54.8%	61.5%	65.5%	58.3%	57.2%
1962	62.9	71.1	79.8	64.0	59.7
1963	64.7	78.0	88.3	68.8	66.3
1964	68.4	80.0	90.7	67.7	71.8
1965	81.7	95.1	115.9	71.9	82.6
1966	97.9	102.0	113.9	88.4	90.5
1967	100.0	100.0	100.0	100.0	100.0
1968	105.5	111.1	120.3	103.0	106.2
1969	111.9	108.4	116.5	97.3	115.0
1970	108.1	89.5	92.3	81.1	112.0
1971	107.7	97.9	118.6	67.7	109.5
1972	122.2	108.2	135.8	67.0	120.4
1973	143.1	118.3	148.8	75.1	137.7
1974	143.8	108.7	128.2	78.3	144.1
1975	116.5	97.4	111.1	73.3	132.3
1976	131.6	110.6	140.7	69.3	148.2
1977	141.9	121.1	159.7	69.6	159.1
1978	159.4	132.5	169.9	84.2	167.1
1979	175.0	135.4	159.9	100.0	174.9
1980	172.8	116.9	119.0	106.1	171.1
1981	178.4	116.1	122.3	105.0	170.3
1982	169.3	104.9	109.8	98.2	161.9

Source: Federal Reserve Board.

PRODUCTIVITY IN MANUFACTURING

Indexes, 1947 to Date

1977 = 100

	Productivity (a) (Output Per Hour of All Persons)	Constant Dollar Output	Hours (All Persons)	Compensation Per Hour		Unit Labor Costs
				Current	Real (b)	
1947	42.4	33.9	79.9	17.5	47.6	41.3
1948	45.1	35.9	79.4	19.5	49.2	43.3
1949	46.9	34.0	72.4	20.4	52.0	43.5
1950	79.5	38.7	78.2	21.5	54.1	43.4
1951	51.2	43.1	84.2	23.6	55.1	46.2
1952	52.1	44.5	85.4	25.2	57.4	48.3
1953	53.0	47.6	89.8	26.5	60.1	50.1
1954	53.8	44.2	82.1	27.7	62.6	51.6
1955	56.5	48.9	86.6	28.8	65.2	51.0
1956	56.1	49.3	87.9	30.7	68.3	54.7
1957	57.2	49.5	86.5	32.5	70.0	56.8
1958	57.0	45.3	79.4	33.9	71.1	59.6
1959	59.7	50.5	84.7	35.2	73.3	59.0
1960	60.1	50.7	84.4	36.7	75.1	61.1
1961	61.7	50.8	82.3	37.7	76.4	61.1
1962	64.4	55.1	85.6	39.2	78.5	60.9
1963	69.0	59.7	86.5	40.4	79.8	58.5
1964	72.4	64.0	88.4	42.0	82.0	58.1
1965	74.6	69.9	93.6	42.9	82.3	57.4
1966	75.4	75.2	99.7	44.8	83.6	59.4
1967	75.4	75.1	99.6	47.0	85.4	62.4
1968	78.1	79.2	101.4	50.4	87.8	64.6
1969	79.4	81.8	103.0	53.9	89.1	67.9
1970	79.2	77.1	97.3	57.6	89.9	72.7
1971	84.1	78.8	93.7	61.1	91.4	72.7
1972	88.3	86.3	97.8	64.4	93.3	72.9
1973	93.1	96.0	103.2	69.1	94.2	74.2
1974	90.9	92.0	101.2	76.4	93.9	84.1
1975	93.5	85.5	91.4	85.5	96.3	91.4
1976	97.7	93.7	95.9	92.4	98.3	94.6
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978(r)	100.9	105.3	104.5	108.3	100.6	107.4
1979(r)	101.5	108.2	106.6	118.8	99.2	117.0
1980(r)	101.7	103.6	101.8	132.9	97.7	130.6
1981(r)	104.6	105.9	101.2	146.5	97.6	140.0
1982						
1st Quarter	103.6	96.5	92.3	158.9	99.8	153.4
2nd Quarter	102.4	98.2	95.9	155.1	99.4	151.5
3rd Quarter	104.4	96.6	92.5	160.5	99.6	153.6
4th Quarter	104.7	94.2	90.0	162.2	100.2	155.0
1983						
1st Quarter	106.8	96.9	90.7	164.9	102.0	154.4

r - Revised.

(a) The productivity index is obtained by dividing the constant dollar output index by the labor input (hours) index.

(b) Compensation per hour adjusted for changes in the Consumer Price Index.

Source: U.S. Bureau of Labor Statistics.

This table is based on output and compensation data published by the Commerce Department's Bureau of Economic Analysis. The indexes for manufacturing output, which are based on figures taken from Gross National Product components, vary from those for manufacturing production in the tables of industrial production indexes. The latter are generated independently by the Federal Reserve Board from their own survey and using their own methodology.

SELECTED LEADING BUSINESS CYCLE INDICATORS

1949 to Date

		Selected Leading Indicators					
	Composite 12 Leading Indicators (r)	Average Workweek, Mfg.	Layoff Rate, Mfg.	New Orders Consumer Goods	Orders for Plant & Equipment	Net Change in Inventories	Change in Sensitive Prices (r)
	1967 = 100	Hours	Per 100 Employees	$72 Billion	$72 Billion	$72 Billion Annual Rate	Percent
1949	48.7	39.1	2.9	$130.03	$ 32.46	$ −2.8	−1.0%
1950	56.3	40.5	1.3	179.34	52.79	11.5	2.5
1951	56.0	40.6	1.4	193.78	62.15	23.9	−0.5
1952	57.1	40.7	1.4	190.70	53.24	8.8	−0.8
1953	57.9	40.5	1.6	196.17	51.05	−.1	−0.5
1954	58.6	39.6	2.3	183.12	42.62	−12.4	0.3
1955	66.6	40.7	1.5	234.96	58.15	6.8	0.5
1956	66.5	40.4	1.7	216.25	60.63	8.4	−0.1
1957	64.5	39.8	2.1	205.54	52.31	−4.8	−0.6
1958	65.7	39.2	2.6	194.74	47.04	−4.9	0.3
1959	73.1	40.3	2.0	227.48	55.32	11.8	0.3
1960	71.3	39.7	2.4	214.81	54.60	−3.1	−0.5
1961	75.2	39.8	2.2	225.44	55.49	2.1	0.1
1962	79.6	40.4	2.0	241.15	60.54	6.7	−0.2
1963	84.5	40.5	1.8	259.00	65.95	7.5	0.1
1964	90.6	40.7	1.7	280.39	74.89	11.8	0.5
1965	96.0	41.2	1.4	308.24	81.99	13.0	0.1
1966	99.0	41.4	1.2	327.93	94.63	20.7	−0.3
1967	100.0	40.6	1.4	323.14	87.23	10.4	−0.1
1968	107.2	40.7	1.2	346.36	115.03	8.9	0.5
1969	111.1	40.6	1.2	358.23	123.31	11.9	0.6
1970	105.5	39.8	1.8	327.13	105.32	0.0	−0.4
1971	113.5	39.9	1.6	343.15	109.87	3.2	0.4
1972	125.0	40.5	1.1	387.93	121.93	11.5	1.0
1973	132.2	40.7	0.9	434.21	148.99	26.2	2.3
1974	121.2	40.0	1.5	396.34	149.01	6.5	−0.1
1975	115.7	39.5	2.1	341.53	116.89	−20.3	−0.3
1976	130.9	40.1	1.3	391.24	132.21	8.4	1.1
1977	139.4	40.3	1.1	432.99	146.40	13.1	0.4
1978	145.8	40.4	0.9	458.73	172.55	20.7	1.3
1979	145.1	40.2	1.1	450.15	186.09	8.9	0.9
1980	138.2	39.7	1.7	399.89	171.94	−9.1	0.0
1981	140.9	39.8	1.5	397.39	168.81	3.4	−0.6
1982(p)	137.0	38.9	NA	353.43	148.09	−14.6	−0.7
1982 1st Qtr.(p)	125.3	38.7	NA	89.18	40.18	−20.5	−0.8
2nd Qtr.(p)	127.6	39.1	NA	90.36	36.93	−15.8	−0.8
3rd Qtr.(p)	137.0	39.0	NA	89.51	34.51	−8.6	−0.6
4th Qtr.(p)	139.9	38.9	NA	84.38	36.47	−13.5	−0.5
1983 1st Qtr.(p)	147.8	39.5	NA	94.85	71.36	−17.1	0.9

NA - Not Available.   p - Preliminary.   r - Revised.

Note: New orders, plant and equipment orders, and change in inventory data are based in 1972 dollars.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Business Conditions Digest" (monthly).

Twelve economic indicators normally precede changes in the business year. These are the "leading indicators", six of which are shown separately in the table together with the composite of the 12.

BUSINESS CYCLE REFERENCE DATES
1854 to Date

Trough		Peak		Expansion Duration (in Months) (a)
Dec.	1854	June	1857	30
Dec.	1858	Oct.	1860	22
June	1861	Apr.	1865	46(b)
Dec.	1867	June	1869	18
Dec.	1870	Oct.	1873	34
Mar.	1879	Mar.	1882	36
May	1885	Mar.	1887	22
Apr.	1888	July	1890	27
May	1891	Jan.	1893	20
June	1894	Dec.	1895	18
June	1897	June	1899	24
Dec.	1900	Sept.	1902	21
Aug.	1904	May	1907	33
June	1908	Jan.	1910	19
Jan.	1912	Jan.	1913	12
Dec.	1914	Aug.	1918	44(b)
Mar.	1919	Jan.	1920	10
July	1921	May	1923	22
July	1924	Oct.	1926	27
Nov.	1927	Aug.	1929	21
Mar.	1933	May	1937	50
June	1938	Feb.	1945	80(b)
Oct.	1945	Nov.	1948	37
Oct.	1949	July	1953	45(b)
May	1954	Aug.	1957	39
Apr.	1958	Apr.	1960	24
Feb.	1961	Dec.	1969	106(b)
Nov.	1970	Nov.	1973	36
Mar.	1975	Jan.	1980	58
July	1980	July	1981	12
Average Peacetime Cycles:				
25 cycles, 1854-1981				27
11 cycles, 1919-1981				31
6 cycles, 1945-1981				34

(a) Time period from trough to peak.
(b) Wartime expansions (Civil War, World War I and II, Korean War and Vietnam War.)

Source: National Bureau of Economic Research, Inc.

The historical business cycle turning dates, above, are those designated by the National Bureau of Economic Research, Inc. (NBER). They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high (peak) or low (trough) levels.

MANUFACTURERS' INVENTORIES

Major Industry Groups, 1967 to Date

(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Total Manufacturing	Durables	By Industry Group: Primary Metals	By Industry Group: Fabricated Metal Products	By Capital Goods Industries: Nondefense	By Capital Goods Industries: Defense
1967	$ 84.7	$ 55.0	$ 7.6	$ 6.6	NA	NA
1968	90.6	58.9	7.5	7.4	$19.8	$ 7.2
1969	98.2	64.7	8.1	7.6	22.6	7.6
1970	101.7	66.8	9.0	7.8	24.6	4.9
1971	102.7	66.3	9.1	8.0	24.2	4.0
1972	108.2	70.3	9.6	8.5	25.3	4.3
1973	124.6	81.4	10.0	9.9	29.8	4.5
1974	157.8	101.7	13.4	13.4	37.5	4.9
1975	159.9	102.9	15.7	13.1	37.1	5.7
1976	175.2	112.6	17.6	14.4	37.7	6.5
1977	189.2	121.6	18.2	15.6	41.6	6.1
1978(r)	210.4	137.8	19.4	17.4	49.4	6.4
1979(r)	241.1	160.6	22.3	19.2	60.0	8.4
1980(r)	264.1	174.5	22.9	19.6	68.5	10.7
1981(r)	282.3	186.2	25.5	20.3	72.9	13.4
1982	264.9	175.2	21.3	17.7	70.3	16.0

NA - Not Available. r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' INVENTORIES

Selected Industry Groups, 1967 to Date

(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products
1967	$11.0	$ 8.4	$ 3.5	$ 9.3	$2.3
1968	11.6	8.8	3.9	10.5	2.5
1969	13.3	9.6	4.1	11.8	2.7
1970	14.4	9.8	4.2	10.4	2.9
1971	14.2	9.4	4.2	9.6	3.0
1972	15.1	9.9	4.7	10.1	3.2
1973	18.4	12.1	5.8	10.7	3.8
1974	24.1	14.0	6.7	12.5	4.9
1975	24.1	13.0	6.1	13.5	4.8
1976	25.3	14.5	8.0	13.1	5.4
1977(r)	27.3	16.4	9.2	13.3	6.0
1978(r)	31.7	19.0	10.2	15.9	6.9
1979(r)	37.1	23.1	10.9	20.7	7.9
1980(r)	40.7	26.0	9.8	26.2	9.1
1981(r)	43.5	28.5	9.1	28.5	9.8
1982	40.2	26.7	8.3	32.3	9.3

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS

Major Industry Groups, 1967 to Date

(Billions of Dollars)

			By Industry Group		By Capital Goods Industries	
Year	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1967	$ 564.7	$ 310.0	$ 45.1	$ 41.7	NA	NA
1968	608.2	337.4	48.1	45.1	$ 84.8	$26.8
1969	647.6	358.6	54.9	47.7	92.9	24.5
1970	624.8	329.0	51.8	44.4	81.6	21.5
1971	671.9	360.1	51.3	44.4	90.2	19.0
1972	770.0	420.8	61.4	52.9	103.5	20.8
1973	915.1	515.2	80.8	64.8	131.7	23.7
1974	1,047.2	562.2	99.0	74.4	152.1	25.7
1975	1,021.8	504.2	74.1	64.4	132.1	24.8
1976	1,194.5	616.8	94.5	76.2	153.6	31.1
1977(r)	1,380.7	733.3	105.9	91.5	183.5	35.2
1978(r)	1,579.4	868.9	125.4	104.6	233.5	41.8
1979(r)	1,769.6	954.2	140.3	116.6	278.8	34.1
1980(r)	1,873.7	952.1	133.9	115.3	279.1	58.7
1981(r)	2,015.1	1,004.7	139.0	122.4	288.7	59.0
1982	1,888.4	901.2	100.9	106.8	248.2	75.1

NA - Not Available. r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' UNFILLED ORDERS

Major Industry Groups, 1967 to Date

(Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1967	$105.0	$101.0	$ 7.2	$13.0	NA	NA
1968	109.9	105.9	6.5	13.9	$ 49.5	$24.7
1969	115.1	111.0	7.9	15.0	53.9	22.4
1970	105.9	101.3	7.7	14.9	47.8	20.2
1971	106.8	101.7	7.4	13.5	49.4	19.6
1972	121.1	114.7	10.3	15.1	54.6	19.7
1973	161.3	153.9	18.5	21.1	70.5	22.0
1974	191.1	185.6	21.9	28.2	86.8	26.3
1975	173.8	165.9	15.1	24.1	79.4	28.1
1976	182.5	174.2	16.8	23.0	81.7	32.0
1977(r)	205.7	197.2	19.5	24.5	90.9	37.2
1978(r)	262.7	252.4	26.8	27.8	116.9	47.8
1979(r)	305.5	294.2	29.6	30.9	149.0	49.0
1980(r)	325.9	315.2	29.4	30.0	155.6	67.1
1981(r)	323.3	313.3	26.3	28.8	146.3	78.1
1982	301.0	291.8	20.2	21.5	122.9	96.7

NA - Not Available. r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS
Selected Industry Groups, 1967 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1967	$ 49.8	$ 43.2	$30.4	$ 45.6	$1.4
1968	51.9	46.3	28.2	57.7	1.5
1969	59.4	48.0	24.7	59.2	1.7
1970	54.9	47.0	17.4	50.0	.9
1971	56.1	48.5	22.5	67.4	.9
1972	70.9	54.1	21.0	75.5	1.4
1973	89.2	64.7	26.7	91.5	2.6
1974	105.3	67.8	29.9	84.1	2.6
1975	92.7	62.8	26.9	82.2	1.3
1976	107.4	77.0	31.9	111.7	2.2
1977(r)	126.7	92.5	40.8	134.1	3.0
1978(r)	154.5	106.8	54.9	158.2	4.3
1979(r)	174.6	121.6	68.3	154.2	5.6
1980(r)	180.6	135.6	73.1	129.0	4.8
1981(r)	200.5	144.7	64.1	139.6	2.9
1982	162.9	147.1	68.0	132.9	1.5

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' UNFILLED ORDERS
Selected Industry Groups, 1967 to Date
(Billions of Dollars, Seasonally Adjusted)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1967	$19.4	$15.5	$34.8	$ 6.0	$1.3
1968	20.4	16.4	35.5	7.8	1.1
1969	23.7	16.8	33.4	8.7	1.2
1970	22.1	16.6	26.3	8.6	.7
1971	22.2	17.2	26.4	9.6	.6
1972	27.5	18.0	26.2	11.5	1.0
1973	38.9	22.0	27.8	17.4	2.1
1974	51.9	24.0	30.4	20.6	2.6
1975	48.9	22.7	28.1	18.4	1.5
1976	50.8	25.9	28.9	19.6	1.6
1977(r)	55.4	30.1	37.3	19.1	2.3
1978(r)	63.8	36.6	54.7	25.2	3.6
1979(r)	75.0	42.4	74.9	26.9	5.4
1980(r)	74.7	49.5	89.4	27.8	5.5
1981(r)	73.5	54.0	88.6	26.9	3.3
1982	55.7	60.6	92.7	28.2	1.2

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1967 to Date
(Billions of Dollars)

Year	Total Manufacturing	Durables	By Industry Group		By Capital Goods Industries	
			Primary Metals	Fabricated Metal Products	Nondefense	Defense
1967	$ 557.8	$ 303.2	$ 45.1	$ 40.1	NA	NA
1968	603.2	332.4	48.7	44.1	$ 81.4	$26.7
1969	642.5	353.7	53.5	46.6	88.5	26.5
1970	634.0	338.6	52.0	44.5	87.5	23.8
1971	671.1	359.7	51.6	45.7	88.5	19.7
1972	756.3	408.3	58.4	51.5	97.9	20.2
1973	875.2	476.2	72.7	58.9	115.8	21.4
1974	1,017.5	530.7	95.6	67.3	135.9	21.3
1975	1,039.1	523.9	80.8	68.5	139.6	23.0
1976	1,185.6	608.3	93.0	77.4	151.4	25.7
1977	1,358.4	711.2	103.2	90.0	174.5	30.1
1978(r)	1,522.9	814.2	118.1	101.3	207.6	31.2
1979(r)	1,727.2	912.7	137.4	113.6	247.1	32.9
1980(r)	1,852.7	930.6	133.9	116.2	272.4	40.6
1981(r)	2,017.5	1,006.5	141.9	123.7	297.8	48.1
1982	1,910.1	922.1	107.0	114.0	271.4	56.4

NA - Not Available. r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1967 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products	Machine Tools
1967	$ 49.2	$ 42.2	$ 40.3	$32.2	$11.2	$1.8
1968	51.0	45.2	49.5	34.1	12.3	1.7
1969	56.1	47.6	50.9	34.2	13.1	1.6
1970	56.5	47.2	42.5	32.0	13.1	1.4
1971	56.0	48.0	58.2	30.6	13.5	1.0
1972	65.8	53.4	63.9	30.8	15.5	1.0
1973	77.8	60.9	74.8	35.8	17.9	1.5
1974	92.5	65.8	68.6	39.6	21.0	2.0
1975	95.8	64.2	70.0	43.5	22.1	2.5
1976	105.5	73.9	95.4	45.6	25.0	2.1
1977	122.2	88.4	117.7	49.2	28.9	2.3
1978	143.2	100.5	132.0	56.8	33.7	3.0
1979(r)	166.5	116.0	131.4	70.2	37.7	3.9
1980(r)	180.7	128.6	104.6	82.0	44.1	4.7
1981(r)	201.5	140.2	117.0	88.2	48.3	5.1
1982	180.6	140.6	112.2	83.2	48.9	3.6

r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1972-1980" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

SHIPMENTS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1977 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1977	1978	1979	1980	1981	1982
Metalworking Machinery Industry (SIC 354) (a,r)						
Jan.	$ 470	$ 584	$ 654	$ 822	$ 885	$ 916
Feb.	581	666	811	994	1,091	953
Mar.	626	746	906	1,087	1,150	987
Apr.	551	689	773	898	1,018	817
May	554	688	809	933	971	789
June	664	786	924	1,077	1,114	888
July	513	619	746	763	860	719
Aug.	539	680	792	835	930	764
Sept.	641	822	938	1,009	1,115	772
Oct.	586	733	918	1,021	1,029	681
Nov.	600	722	894	1,002	912	659
Dec.	672	773	908	1,077	943	676
TOTAL	$6,997	$8,508	$10,073	$11,518	$12,018	$9,621
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	$ 145	$ 209	$ 245	$ 331	$ 389	$ 384
Feb.	169	202	280	355	422	360
Mar.	183	272	333	460	477	411
Apr.	177	243	305	343	448	303
May	186	256	323	375	411	296
June	222	293	351	476	509	409
July	168	208	268	327	367	250
Aug.	145	215	285	311	325	257
Sept.	211	264	347	411	442	276
Oct.	193	267	380	440	407	201
Nov.	222	274	361	400	408	194
Dec.	260	310	399	463	491	264
TOTAL	$2,281	$3,013	$ 3,877	$ 4,692	$ 5,096	$3,604

r - Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Shipments of new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-80" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The cyclical nature of the machine tool industry is apparent in both new orders and shipment figures. Shipments totaled almost $2.5 billion by 1975, dropped by 16% in 1976, grew to almost $5.1 billion in 1981, and fell by 29% to $3.6 billion in 1982.

NET NEW ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1977 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1977	1978	1979	1980	1981	1982
Metalworking Machinery Industry (SIC 354) (a,r)						
Jan.	$ 533	$ 616	$ 820	$ 1,056	$ 898	$ 681
Feb.	545	874	1,002	1,210	948	602
Mar.	675	866	1,099	1,282	1,059	597
Apr.	633	745	1,001	921	880	541
May	685	910	978	860	742	562
June	739	916	1,003	1,064	891	755
July	606	835	970	764	648	529
Aug.	683	931	1,005	664	807	640
Sept.	693	850	1,278	943	781	525
Oct.	680	818	1,096	900	790	566
Nov.	689	953	1,049	806	648	523
Dec.	765	815	940	970	475	538
TOTAL	$7,926	$10,129	$12,241	$11,440	$9,567	$7,059
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	—	—	—	—	$ 291	$ 205
Feb.	—	—	—	—	280	164
Mar.	$ 667	$ 940	$ 1,471	$ 1,517	350	138
Apr.	—	—	—	—	320	151
May	—	—	—	—	229	106
June	771	1,130	1,356	1,335	318	126
July	—	—	—	—	192	107
Aug.	—	—	—	—	214	87
Sept.	725	1,028	1,353	818	187	87
Oct.	—	—	—	—	216	119
Nov.	—	—	—	—	196	88
Dec.	832	1,251	1,440	984	152	121
TOTAL	$2,995	$ 4,349	$ 5,621	$ 4,754	$2,945	$1,498

r - Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Net new orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972-80" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The most dramatic indicator of the cyclical nature of the machine tool business is new orders, which generally follow the growth of the economy except that the cycles involved are much more pronounced. In 1975 new orders were only 45% of the level experienced in 1973. The economic recovery since the 1974 recession was especially strong in the machine tool sector with 1979 orders running at record levels, well in excess of $5 billion. This strength in machine tool orders continued into early 1980, but slowed significantly in the second half of the year. The slackening of the order rate was produced by the reductions in capital investment spending which followed the sharp decline in GNP of the second quarter of the year. In spite of newly introduced investment incentives, the tight money supply situation and the deepening recession of 1981 caused net new orders to continue weakening throughout 1981, yielding a 38% decline for the year. As the recession continued, net new orders fell a further 49% in 1982.

UNFILLED ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1977 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1977	1978	1979	1980	1981	1982
Metalworking Machinery Industry (SIC 354) (a,r)						
Jan.	$2,832	$3,730	$5,485	$7,721	$7,422	$4,723
Feb.	2,796	3,938	5,676	7,937	7,279	4,372
Mar.	2,845	4,058	5,869	8,132	7,188	3,982
Apr.	2,927	4,114	6,097	8,155	7,050	3,706
May	3,058	4,336	6,266	8,082	6,821	3,479
June	3,133	4,466	6,345	8,069	6,598	3,346
July	3,226	4,682	6,569	8,070	6,386	3,156
Aug.	3,370	4,533	6,782	7,899	6,263	3,032
Sept.	3,422	4,961	7,122	7,833	5,929	2,785
Oct.	3,516	5,046	7,300	7,712	5,690	2,670
Nov.	3,605	5,277	7,455	7,516	5,426	2,534
Dec.	3,698	5,319	7,487	7,409	4,958	2,396
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	—	—	—	—	$5,353	$3,122
Feb.	—	—	—	—	5,211	2,926
Mar.	$1,764	$2,565	$4,257	$5,760	5,083	2,653
Apr.	—	—	—	—	4,956	2,500
May	—	—	—	—	4,773	2,310
June	1,950	2,904	4,635	5,902	4,583	2,027
July	—	—	—	—	4,408	1,883
Aug.	—	—	—	—	4,296	1,713
Sept.	2,152	3,244	5,089	5,770	4,042	1,524
Oct.	—	—	—	—	3,852	1,442
Nov.	—	—	—	—	3,639	1,337
Dec.	2,308	3,644	5,388	5,451	3,300	1,194

r - Revised.

(a) Adjusted for trading-day and calendar month variation.

(b) Unfilled orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1972- 80" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

During the current recession a large backlog of unfilled orders has protected the machine tool industry from too severe an impact resulting from the decline in orders. The backlog of unfilled orders, which had increased continuously for four years, peaked in mid-1980 at just over $5.6 billion. Since then, the slack pace of the economy has enabled builders to reduce the size of the accumulated volume of unfilled orders to $1.2 billion by the end of 1982.

PRODUCER PRICE INDEXES
For Selected Machine Tool Materials and Components

1967 = 100, unless otherwise indicated

Commodity	1970	1975	1976	1977	1978	1979	1980	1981	1982
Finished Goods	NA	163.4	170.3	180.6	194.6	216.1	247.0	269.8	285.5
All Commodities	110.4	174.9	182.9	194.2	209.3	235.6	268.8	293.4	300.7
Industrial Commodities	110.0	171.5	182.3	195.1	209.4	236.5	274.8	304.1	315.2
Manufactured Durables	112.0	165.6	175.5	188.1	204.7	226.1	250.8	269.7	283.2
Industrial Power, 500 KW Demand	106.6	209.7	226.9	257.0	279.5	305.3	368.1	422.2	480.9
Lubricating Oil Materials	100.0	266.5	265.1	304.3	349.5	477.9	756.4	873.6	820.1
Prepared Paint	112.4	166.9	174.2	182.4	192.3	204.4	235.3	249.8	264.7
Iron and Steel	115.[illegible]	200.9	215.8	230.4	253.6	283.5	305.2	333.8	332.8
Steel Mill Products	114.2	197.2	209.7	229.9	254.5	280.4	302.7	337.6	344.7
Semi-finished Steel Products	112.2	206.7	223.0	243.6	270.5	294.3	325.6	359.3	368.7
Finished Steel Products	114.2	196.6	208.9	229.0	253.5	279.5	301.2	336.2	343.3
Foundry and Forge Shop Products	112.1	194.3	218.3	230.5	249.5	277.1	310.0	329.8	346.3
Gray Iron Castings	112.2	180.1	199.7	211.1	225.1	245.5	270.7	NA	NA
Steel Castings	119.5	196.8	216.3	234.4	257.3	291.9	327.8	NA	NA
Gray & Ductile Iron Cast Dec. 1980 = 100	NA	NA	NA	NA	NA	NA	NA	105.2	110.5
Nonferrous Metals	124.7	171.6	181.5	195.4	207.8	261.7	305.0	285.8	263.2
Primary Metal Refinery Shapes	127.7	184.8	191.6	206.0	218.3	295.4	377.2	326.1	289.8
Mill Shapes	122.1	180.9	194.1	213.1	229.9	270.4	292.7	304.1	304.4
Aluminum Shapes	109.7	163.8	176.8	202.1	226.5	247.3	266.7	293.4	294.8
Wire and Cable	126.7	152.3	151.3	156.1	155.2	186.5	217.6	207.5	197.4
Metalworking Machinery and Equipment	114.1	171.6	182.7	198.5	217.0	241.3	274.4	301.3	323.6
Cutting Tools & Access.	113.6	146.0	153.9	172.0	187.5	206.8	233.2	256.3	272.3
Abrasive Products	112.3	163.9	177.8	193.4	205.6	223.4	252.5	276.5	298.4
Metal Cutting Machine Tools	113.5	177.1	190.9	206.3	231.5	266.9	313.5	344.8	372.1
Metal Forming Machine Tools	115.6	192.2	212.9	232.6	262.8	300.1	346.7	380.3	411.6
General Purpose Machy. & Equipment	113.7	178.5	189.7	201.8	216.6	236.4	264.6	288.7	307.0
Pumps, Compressors, & Equipment	114.7	187.4	197.9	211.6	228.0	249.1	287.7	324.5	348.5
Fluid Power Equipment, Dec. 1970 = 100	NA	135.0	143.8	152.7	163.3	176.2	199.6	222.3	249.6
Fluid Power Pumps, Dec. 1970 = 100	NA	133.4	143.0	152.0	161.7	174.9	198.6	223.9	251.8
Fluid Power Valves, Dec. 1970 = 100	NA	127.2	134.2	142.6	150.3	162.1	180.5	200.1	228.0
Cylinders,Dec. 1971 = 100	NA	133.7	142.3	151.1	164.3	177.7	205.5	230.1	261.9
Fluid Power Hose and Tube Fittings, Dec. 1972 = 100	NA	135.8	143.3	151.3	166.5	178.0	204.3	223.5	238.9
Mechanical Power Transmission Equipment	115.3	173.7	185.1	196.6	213.0	234.6	264.0	294.8	312.1
Miscellaneous General Purpose Equipment	112.5	185.7	195.6	206.9	222.7	246.4	279.4	307.0	325.4
Ball & Roller Bearings	109.6	164.2	176.4	191.4	206.3	227.0	265.1	304.8	335.3
Electrical Machinery and Equipment	106.4	140.7	146.6	154.1	164.9	178.9	201.7	220.2	234.2
Motors, Generators, Motor Generator Sets	116.7	174.8	193.0	202.2	218.1	234.6	266.3	296.1	317.3
Electric Motors	114.8	166.8	179.2	192.5	207.3	229.0	252.3	278.8	308.5
Transformers and Power Regulators	99.2	134.5	138.4	146.5	155.2	164.3	182.7	208.8	220.3
Switchgear, Switchboard, etc. Equipment	106.7	154.5	161.8	173.9	184.0	200.0	233.0	250.8	265.3
Electronic Components and Accessories	101.0	115.5	115.4	119.5	126.9	135.8	156.3	168.1	178.5

NA - Not Available.

Note: The individual commodities shown are selected components of each major commodity grouping. All indexes are annual averages.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

NATIONAL DEFENSE PURCHASES
IMPLICIT PRICE DEFLATORS
By Major Type of Product, 1973 to Date

(Index 1972 = 100)

Year	Total Purchases	Durables Goods	Non-Durable Goods	Services (a)	Structures	Compensation
1973	106.6	102.9	112.6	105.8	113.2	107.4
1974	115.1	104.6	170.4	116.3	126.5	113.0
1975	124.9	114.9	190.9	130.7	138.5	120.9
1976	132.4	124.2	205.8	141.0	144.3	126.9
1977(r)	141.9	135.4	225.6	154.2	150.5	134.0
1978(r)	152.7	148.2	243.4	165.0	160.9	143.1
1979(r)	166.0	164.3	298.1	177.1	183.5	152.2
1980(r)	187.4	183.5	437.2	197.0	203.8	165.3
1981(r)	209.0	203.5	486.9	217.9	221.5	185.3
1982(p)	227.2	225.9	488.1	213.4	232.6	201.7

r - Revised. p - Preliminary.

(a) Services excluding compensation.

Source: U.S. Bureau of Economic Analysis, "Price Changes of Defense Purchases of the United States."

NATIONAL DEFENSE PURCHASES
By Major Type of Product, 1973 to Date

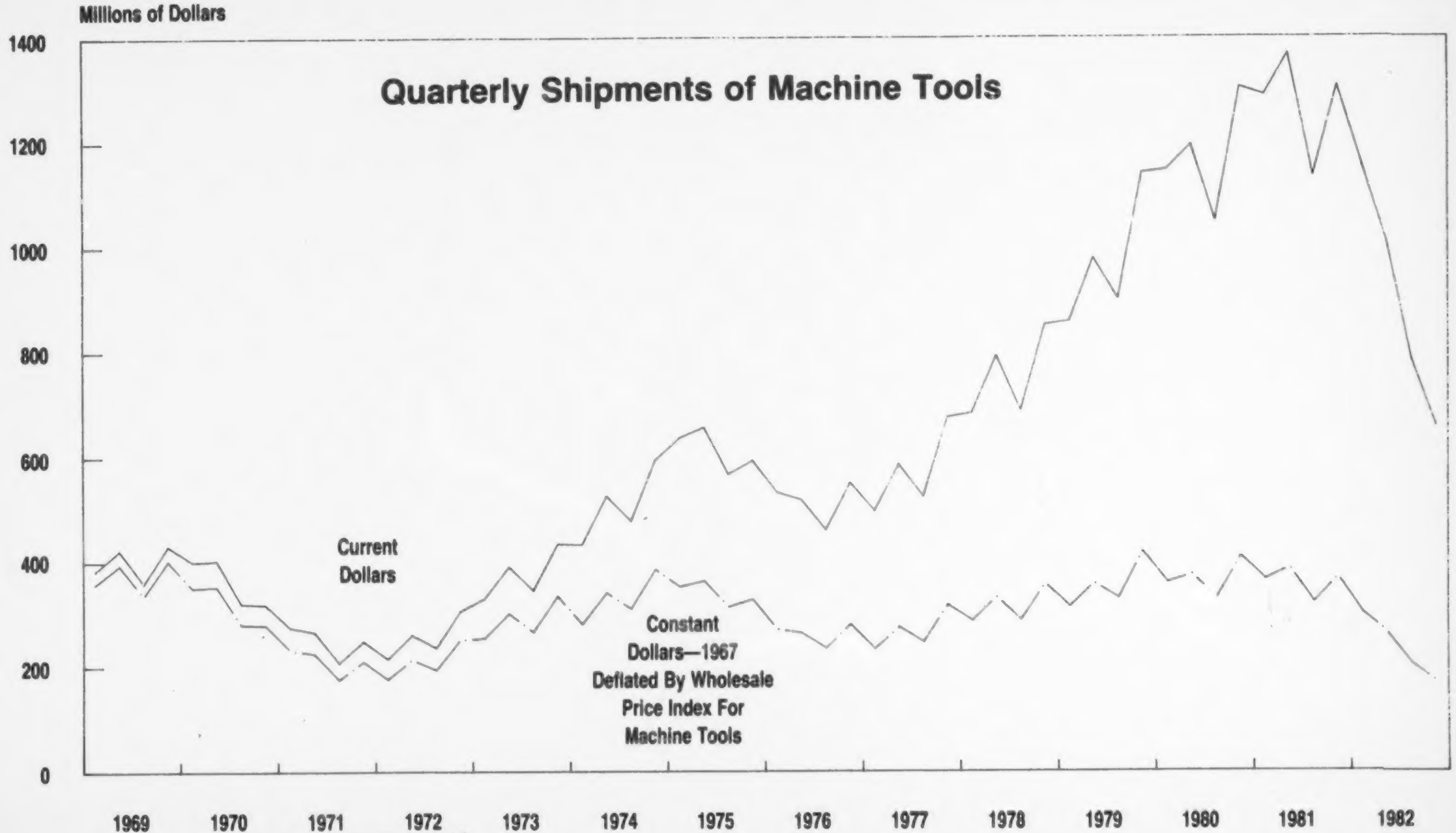
Year	Total Purchases	Durable Goods	Non-Durable Goods	Services (a)	Structures	Compensation
In Current Dollars (Billions)						
1973	$ 72.8	$14.1	$ 4.2	$15.9	$2.4	$36.3
1974	77.0	14.3	5.4	17.3	2.3	37.7
1975	83.0	17.6	5.3	17.8	2.5	39.8
1976	86.0	18.6	4.7	19.5	2.3	40.9
1977(r)	92.8	22.3	5.0	20.3	2.4	42.8
1978(r)	100.3	24.1	5.5	22.1	2.5	46.1
1979(r)	111.8	29.0	6.6	25.1	2.5	48.7
1980(r)	131.4	33.6	10.7	30.8	3.0	53.2
1981(r)	153.7	40.1	12.6	37.2	3.0	60.8
1982(p)	178.6	49.0	13.9	44.9	3.6	67.2
In Constant 1972 Dollars (Billions)						
1973	$68.3	$13.7	$3.7	$15.0	$2.1	$33.8
1974	66.9	13.7	3.2	14.9	1.8	33.3
1975	86.4	15.4	2.8	13.6	1.8	32.9
1976	64.9	15.0	2.3	13.8	1.6	32.3
1977(r)	65.4	16.5	2.2	13.2	1.6	32.0
1978(r)	65.7	16.2	2.2	13.4	1.6	32.2
1979(r)	67.4	17.7	2.2	14.2	1.4	32.0
1980(r)	70.1	18.3	2.4	15.7	1.5	32.2
1981(r)	73.5	19.7	2.6	17.1	1.4	32.8
1982(p)	78.6	21.7	2.9	19.2	1.6	33.3

r - Revised. p - Preliminary.

(a) Services excluding compensation.

Source: U.S. Bureau of Economic Analysis, "Price Changes of Defense Purchases of the United States".

The estimates in the above tables are from a report prepared by the Bureau of Economic Analysis (BEA). Prior to 1980, the BEA included only Department of Defense purchases in the defense spending series. Beginning in 1980, their statistics include defense activities of other Federal agencies as well. These tables have been revised to reflect that change.


Quarterly Shipments of Machine Tools

PRODUCER PRICE INDEXES FOR MACHINE TOOLS
1947 to Date
1967 = 100

Year	All Commodities	Durable Manufactures	Total (a) Machine Tools	Metal Cutting Machine Tools	Metal Forming Machine Tools
1947	76.5	59.3	35.7	34.3	39.6
1948	82.8	65.3	39.9	38.8	43.1
1949	78.7	67.3	47.2	41.2	45.1
1950	81.8	69.6	45.5	44.2	49.0
1951	91.1	76.3	52.7	51.6	55.7
1952	88.6	76.7	56.1	55.3	58.5
1953	87.4	78.4	56.9	55.8	59.8
1954	87.6	79.4	57.2	56.1	60.4
1955	87.8	82.2	60.1	58.3	65.2
1956	90.7	87.5	68.1	66.3	73.7
1957	93.3	90.9	72.8	71.3	77.8
1958	94.6	92.1	74.0	72.7	76.9
1959	94.8	94.0	75.2	74.3	77.5
1960	94.9	94.1	77.4	76.5	79.6
1961	94.5	93.6	79.0	78.8	79.5
1962	94.8	93.5	80.8	80.5	81.4
1963	94.5	93.6	81.1	80.8	81.9
1964	94.7	94.6	84.1	83.9	84.4
1965	96.6	95.8	88.6	88.3	89.3
1966	99.8	97.9	94.4	94.1	95.6
1967	100.0	100.0	100.0	100.0	100.0
1968	102.5	103.5	103.3	103.0	104.1
1969	106.5	107.7	107.1	106.8	107.4
1970	110.4	112.0	114.1	113.5	115.6
1971	113.9	117.0	118.2	117.1	121.0
1972	119.1	121.1	121.7	120.2	125.3
1973	134.7	127.4	129.6	128.2	133.3
1974	160.1	148.6	153.9	152.0	161.7
1975	174.9	165.6	180.5	177.1	192.2
1976	182.9	175.5	196.5	190.9	212.9
1977	194.2	188.0	213.3	206.3	232.6
1978	209.3	204.7	238.5	231.5	262.8
1979	235.6	226.1	273.2	266.9	300.1
1980	268.8	250.8	319.0	313.5	346.7
1981	293.4	269.[illegible]	353.4	344.8	380.3
1982	300.7	283.[illegible]	383.5	372.1	411.6

(a) Constructed by NMTBA from BLS producer price indexes for metal cutting and metal forming machine tools using NMTBA net new order weights.

Source: U.S. Dept. of Labor, Bureau of Labor Statistics: U.S. Dept. of Commerce, "Business Statistics, 1977," "Survey of Current Business" (monthly), and NMTBA.

Because of the continuous technological improvement in machine tools and the increasing number of "custom built" machines, reliable wholesale price indexes (which are intended to measure price changes not influenced by changes in quality, product mix, etc.) are difficult to develop. The data should be used with caution.

SHIPMENTS OF MACHINE TOOLS AT CONSTANT PRICES

1947 to Date

(In 1982 Dollars)

Year	Metal Cutting		Metal Forming (a)	
	Current Dollars (Thousands)	1981 Dollars (Thousands)	Current Dollars (Thousands)	1981 Dollars (Thousands)
1947	$ 306,000	$3,319,592	—	—
1948	288,450	2,766,376	—	—
1949	249,150	2,250,271	—	—
1950	305,550	2,572,186	—	—
1951	632,250	4,559,386	—	—
1952	1,125,900	7,575,696	—	—
1953	1,191,200	7,943,452	—	—
1954	891,750	5,914,638	—	—
1955	670,400	4,278,785	—	—
1956	945,200	5,304,748	$ 432,100	$2,413,158
1957	900,150	4,697,579	342,550	1,812,242
1958	438,400	2,243,833	152,800	817,856
1959	440,600	2,206,530	175,400	931,542
1960	541,500	2,633,883	202,500	1,047,107
1961	541,250	2,555,839	209,650	1,085,426
1962	612,850	2,832,809	208,400	1,053,803
1963	638,450	2,940,134	257,300	1,293,095
1964	844,650	3,746,009	319,700	1,559,132
1965	1,022,550	4,309,102	403,050	1,857,716
1966	1,221,750	4,831,152	463,450	1,995,393
1967	1,353,200	5,035,350	452,750	1,863,552
1968	1,358,300	4,906,976	368,600	1,457,378
1969	1,192,450	4,154,589	405,100	1,552,524
1970	992,900	3,255,090	450,150	1,602,756
1971	672,300	2,136,320	325,600	1,107,596
1972	714,450	2,211,714	304,250	999,442
1973	1,073,750	3,116,565	427,250	1,322,223
1974	1,445,850	3,539,499	584,700	1,488,316
1975	1,878,650	3,947,158	573,050	1,227,193
1976	1,482,100	2,888,915	577,550	1,116,578
1977	1,650,800	2,977,526	629,950	1,114,739
1978	2,188,500	3,517,697	824,950	1,292,053
1979	2,930,050	4,084,946	946,500	1,298,158
1980	3,680,800	4,368,798	1,010,950	1,200,197
1981	4,104,500	4,429,492	991,100	1,072,665
1982	2,894,750	2,894,750	709,650	709,650

(a) Shipment data not available prior to 1956.

Note: 1982 dollar values developed from the Producer Price Index (formerly Wholesale Price Index) for metal cutting and metal forming machine tools.

Source: U.S. Department of Labor, Bureau of Labor Statistics, NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

When converted to constant dollars, the apparent record shipments in recent years disappear. For the years shown above, the historical constant dollar average for metal cutting is $3,804,094 and for metal forming is $1,008,097.

2

WORLD ECONOMY

The tables in this chapter are intended to provide a perspective of the U.S. position in the world economy. The picture has changed dramatically in the last three decades as the rate of economic growth in many of the world's industrialized nations has surpassed that of the U.S. and their per capita income is approaching the levels achieved domestically. Also, the changes in the world's economic structure brought about by OPEC and the growth of many developing nations into newly industrialized powers have led to major shifts in the balance of economic power in the world. The rise to wealth of these developing nations has been accompanied by a substantial increase in world trade. Increasing specialization by these and the major industrial nations has created an environment of interdependence in which each nation is but a piece of the larger world economic puzzle.

Trends in growth rates in selected industrialized countries are presented in tables on Gross National Product, Real Gross National Product, and Industrial Production. Factors underlying these growth trends are found in the tables on international investment patterns and various tables of comparative prices, wages, productivity, and unit labor costs. The data and charts on cost recovery allowable for tax purposes on machinery and equipment in selected industrial countries are especially interesting. These graphically demonstrate how our industrial competitors are able to invest more than the average American firm, and by inference, they also demonstrate why the U.S. rate of productivity growth is considerably lower than that of our major competitors.

Growth in the world economy and world trade has brought about a growing interest in the balance of payments positions of the various countries. A nation's balance of payments is considered a key indicator of the health or weakness of an individual economy. The same can be said for an industry trading in the world marketplace. In recent years disparate inflation rates, exchange rate movements, the phasing of national business cycles, and energy related problems have caused dislocations in many nations' and industries' balance of payments positions.

The overall United States balance of trade has fluctuated in recent years between small surpluses and record deficits. Until 1978, the U.S. machine tool industry remained in surplus in its world trade position though the relative size of the surplus had been declining during the 1970's. Record high machine tool imports by U.S. manufacturers coupled with only relatively small increases in machine tool exports led to substantial balance of trade deficits in U.S. machine tool trade in 1978 through 1982. In a little over a decade the share of the domestic market represented by imports has grown from a negligible amount to almost one-third of total U.S. machine tool consumption.

The tables in this chapter provide comparative international statistics on world trade, balance of trade, balance of payments and export prices.

GROSS NATIONAL PRODUCT

(Billions of U.S Dollars)

	1973	1974	1975	1976	1977	1978(r)	1979(r)	1980(a)(r)	1981(r)	1982
WORLD	$5,295	$5,990	$6,552	$7,227	$7,960	$9,660	$10,807	$12,215	$11,725	NA
Of which:										
United States	1,326	1,567	1,549	1,718	1,918	2,164	2,418	2,633	2,938	$3,059
Canada	124	151	163	194	196	202	223	250	276	283
Japan	417	463	498	559	687	963	999	1,040	1,139	1,060
European Comm.(b)	1,065	1,167	1,100	1,149	1,312	1,619	1,937	2,162	1,845	1,750
United Kingdom	180	195	235	228	251	319	412	525	506	472
France	250	265	340	352	385	476	576	657	569	525
West Germany	344	381	421	447	517	642	761	817	683	659
Italy	142	156	191	188	215	262	326	396	351	344
U.S.S.R.(a)	681	784	903	975	1,066	1,152	1,260	1,393	1,587	1,715E
China(a)	231	263	307	323	142	179	215	244	228	225
PER CAPITA										
United States	$6,210	$6,668	$7,173	$7,879	$8,709	$9,721	$10,743	$11,566	$12,783	$13,167
Canada	5,597	6,735	7,154	8,414	8,436	8,602	9,422	10,418	11,355	11,441
Japan	3,836	4,203	4,465	4,954	6,030	8,383	8,621	8,907	9,684	8,946
European Comm.(b)	4,391	4,797	5,668	5,907	6,730	6,282	9,878	10,993	9,348	8,849
United Kingdom	3,219	3,487	4,200	4,072	4,501	5,706	7,375	9,391	9,060	8,435
France	4,796	5,049	6,431	6,659	7,251	8,932	10,772	12,229	10,550	9,672
West Germany	5,555	6,147	6,803	7,264	8,420	10,475	12,391	13,263	11,072	10,689
Italy	2,583	2,818	3,425	3,338	3,806	4,615	5,727	6,941	6,135	6,009
U.S.S.R.(a)	2,726	3,111	3,541	3,794	4,116	4,414	4,791	5,237	5,593	6,380
China (a)	253	282	323	333	151	184	219	246	226	220

E - Estimate.   NA - Not Available   r - Revised.

(a) Data for the China series prior to 1977 and for the USSR series are reported in U.S. purchasing power equivalents. Data for the China series from 1977 through the present are GDP figures obtained from Chinese agencies.

(b) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain comparability of the time series.

Source: International Monetary Fund, "International Financial Statistics", Department of Commerce, Industry and Trade Administration, and "The Economic Report of the President, 1983."

REAL GNP TRENDS
(1967 = 100)

	United States	Canada	Japan	European Community	United Kingdom(a)	France(a)	West Germany	Italy (a)
1961	75	71	57	78	85	70	80	75
1962	79	76	61	81	86	75	84	79
1963	82	80	68	85	89	80	87	83
1964	87	85	77	90	95	86	92	86
1965	92	91	81	94	96	90	97	88
1966	97	97	89	97	97	95	100	93
1967	100	100	100	100	100	100	100	100
1968	105	106	113	105	104	104	107	106
1969	108	111	127	112	105	112	115	112
1970	107	114	139	117	108	118	122	118
1971	111	122	146	121	111	124	126	120
1972	117	130	159	126	113	132	130	124
1973	124	139	173	133	121	139	137	133
1974	123	144	170	135	120	143	137	138
1975	122	146	175	133	119	143	135	133
1976(r)	129	154	184	138	124	151	142	142
1977(r)	136	158	194	144	126	155	146	145
1978(r)	143	163	204	149	130	161	151	149
1979(r)	147	168	214	154	133	167	157	156
1980(r)	146	169	224	156	130	169	160	162
1981(r)	149	174	233	155	128	169	159	162
1982	147	166	240	155	138	172	158	162

r - Revised.

(a) Gross Domestic Product.

Source: International Monetary Fund, "International Financial Statistics"; Organization for Economic Cooperation and Development.

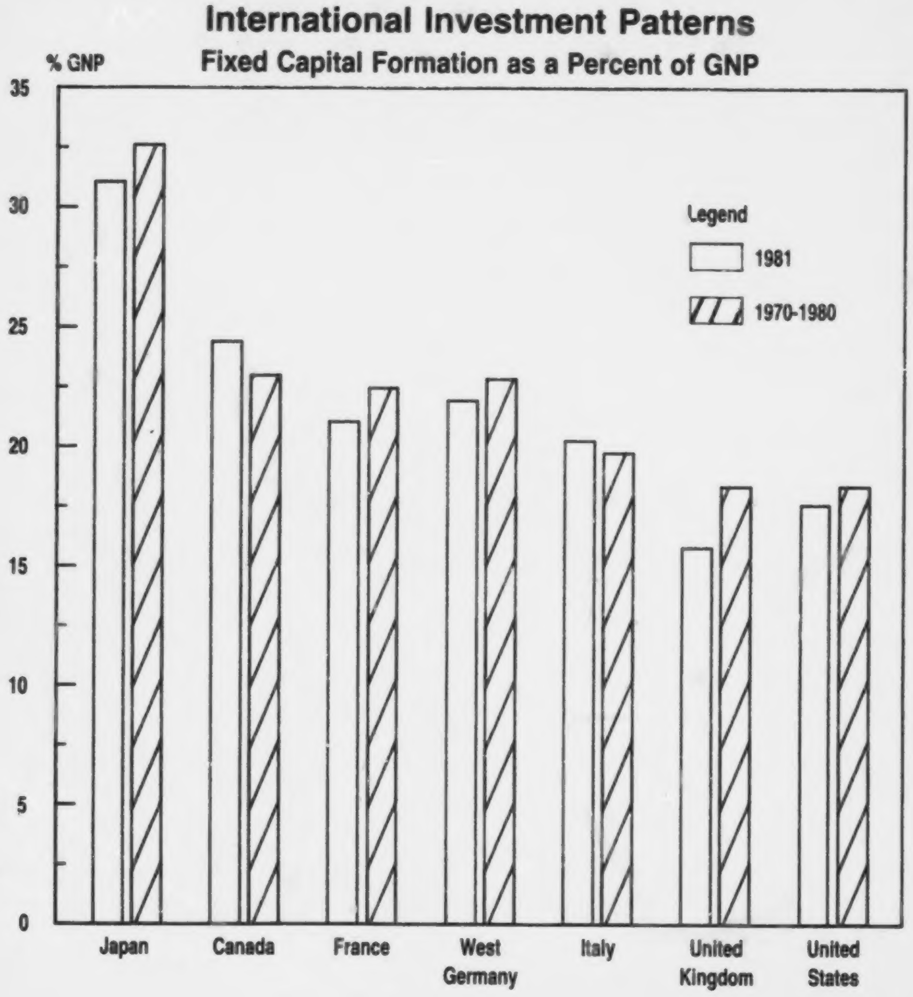
INTERNATIONAL INVESTMENT PATTERNS

	Gross Fixed Capital Formation as Percent of GNP				
	1982	1981	1980	1970-1980	1960-1970
United States	16.5%	17.6%	18.2%	18.3%	15.2%
Italy	19.2	20.3	19.7	19.8	20.8
United Kingdom	NA	15.8	17.5	18.3	17.9
Canada	21.9	24.4	23.6	23.0	22.2
West Germany	20.5	22.0	22.8	22.8	24.8
France	20.6	21.0	21.5	22.5	23.6
Japan	29.7	31.1	32.0	32.6	33.1

Note: Fixed Capital Formation consists of non-residential structures and producers durable equipment as well as residential structures.

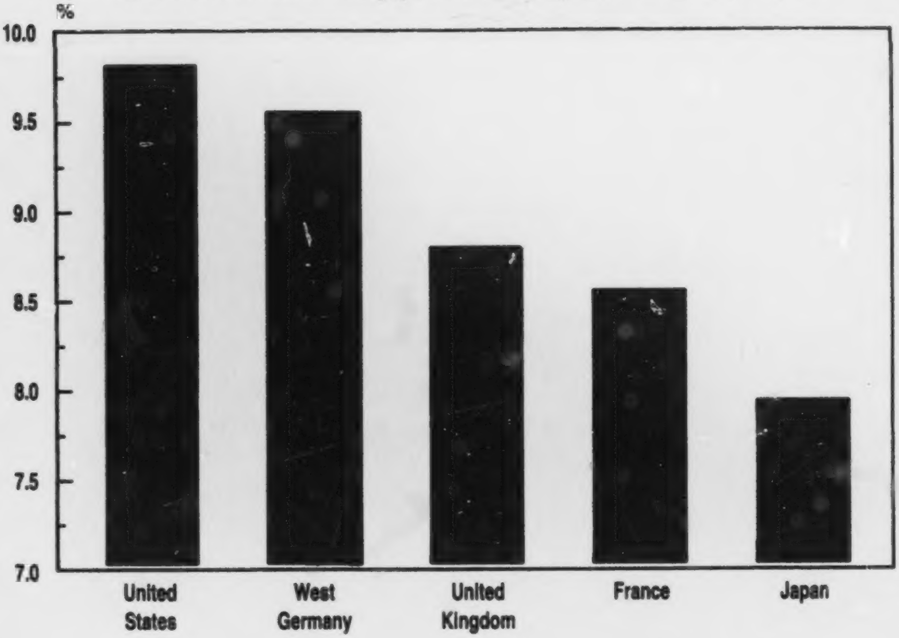
Source: International Monetary Fund, "International Financial Statistics"; U.S. Department of Commerce.

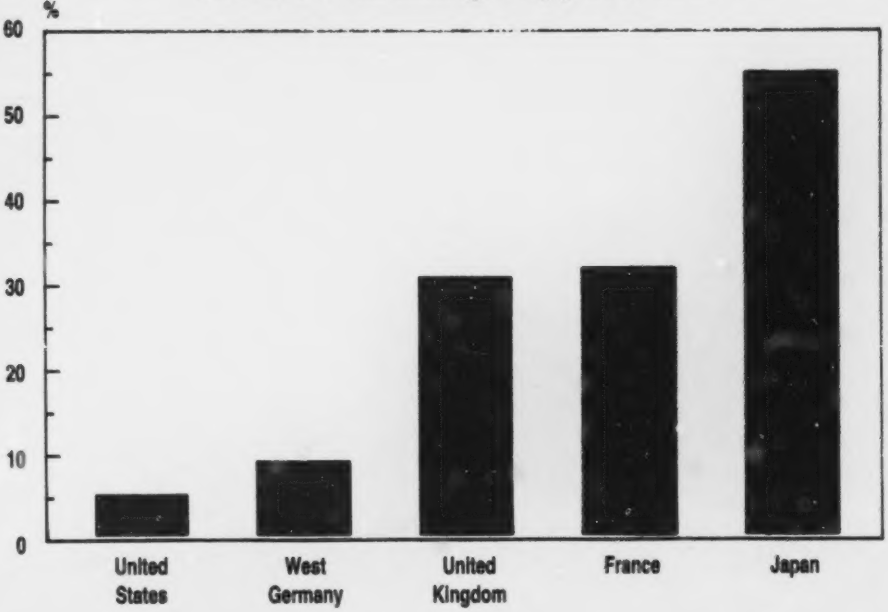
The comparatively low percentage of the total Gross National Product (GNP) which is invested in fixed capital in the United States is one reason for its slower industrial growth. The additional fact that a smaller percentage of this investment is made in industry is another reason for concern for the industrial leadership of the United States.



International Investment Patterns

Fixed Capital Formation as a Percent of GNP


Long Term Interest Rates on Government Supported Export Credit, 1981


Percent of Exports Receiving Official Financing Support, 1981

U.S. DIRECT INVESTMENT (a) ABROAD BY MAJOR INDUSTRY AND COUNTRY—YEAR END 1981

(Billions of U.S. Dollars)

	Total	Manufacturing	Mining and Smelting	Petroleum	Other
Developed Countries	$167.1	$73.2	$4.9	$37.3	$51.7
Canada	47.0	19.7	3.4	10.7	13.2
Europe	101.3	45.5	Z	22.5	33.3
European Community	80.5	41.5	Z	19.0	20.0
United Kingdom	30.1	13.4	D	8.1	D
France	9.1	5.5	Z	D	D
West Germany	16.1	10.3	Z	3.3	2.5
Other EEC	25.2	12.3	D	D	D
Other Europe	20.8	4.0	Z	3.5	13.3
Japan	6.8	3.3	0.0	1.7	1.8
Australia, New Zealand, South Africa	12.0	4.7	1.5	2.4	3.4
Developing Countries	56.1	19.3	2.5	12.1	22.2
Latin America	38.9	15.8	1.9	4.5	16.7
Middle East(c)	2.0	0.2	D	0.7	D
Other Africa (d)	4.3	0.4	0.4	2.7	0.7
Other Asia and Pacific	11.0	2.9	D	4.2	D
Other Countries	4.1	—	—	2.6	1.5
Total	$227.3	$92.5	$7.4	$52.1	$75.4

D - Withheld to avoid disclosure. Z - Less than $50 million.

(a) Book value.

(b) Included in "Other."

(c) Includes Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, South Yemen, Syria, United Arab Emirates, Oman and Yemen.

(d) Includes United Arab Republic (Egypt).

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business," August 1982.

INDUSTRIAL PRODUCTION (a)

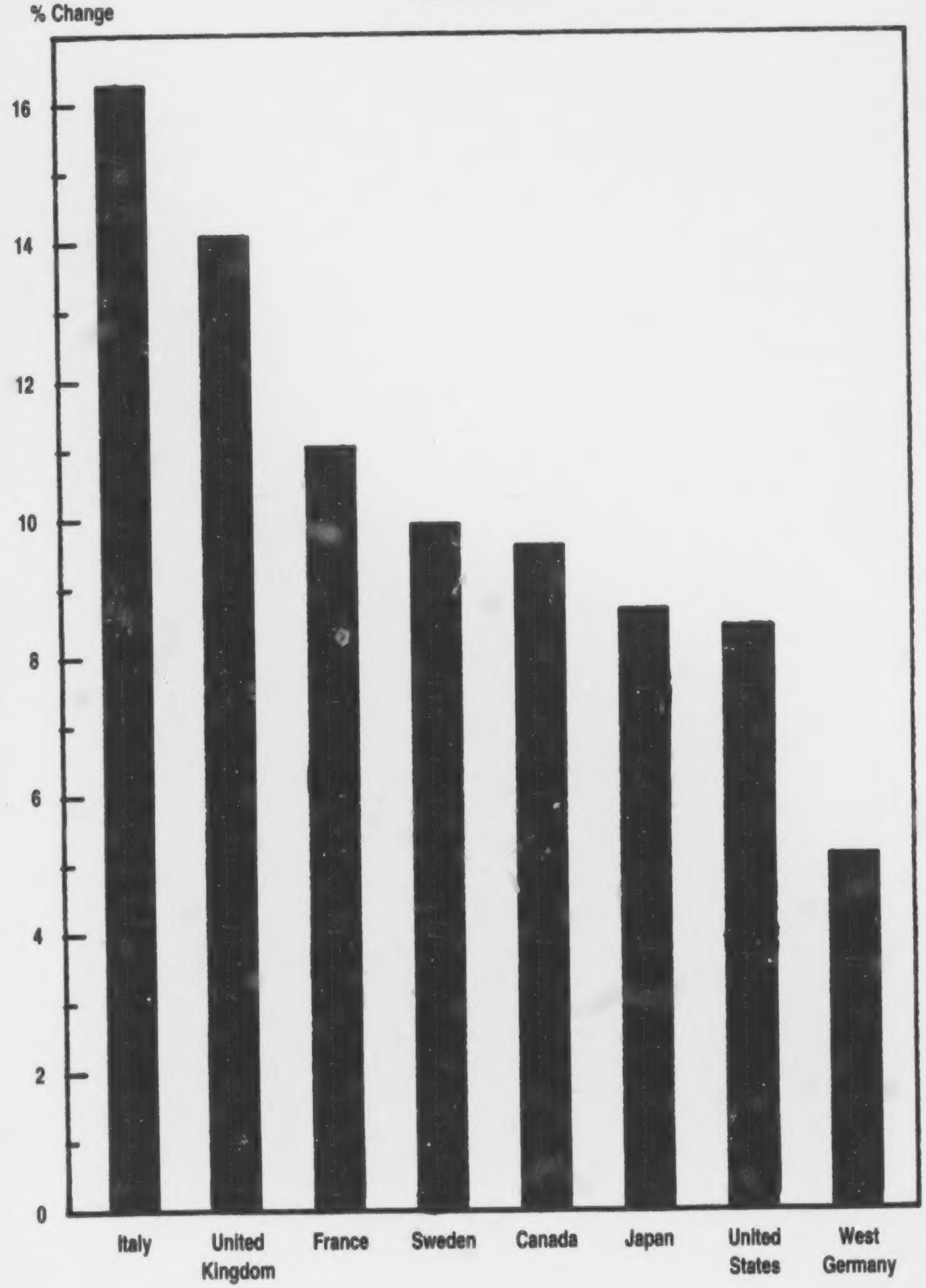
(1975 = 100)

Year	United States	Canada	Japan	EEC	United Kingdom	France	West Germany	Italy
1962	61.3	51.1	33.1	62.2	77.2	59.0	64.2	56.1
1963	64.9	54.5	36.8	65.4	79.4	61.0	66.1	61.4
1964	69.4	59.8	42.7	70.9	86.1	70.0	71.5	62.0
1965	76.2	64.8	44.3	72.4	88.8	67.0	75.4	64.9
1966	83.0	68.9	50.1	74.2	90.2	70.0	76.1	72.4
1967	84.9	71.4	59.9	75.7	91.2	72.0	73.7	78.3
1968	90.2	76.4	70.1	80.8	97.0	75.0	80.4	83.3
1969	94.3	81.3	81.3	89.0	99.6	83.0	91.4	86.6
1970	91.5	82.7	92.5	93.4	99.7	87.0	96.9	92.2
1971	93.0	87.0	94.9	95.4	99.8	92.0	98.7	92.1
1972	101.6	93.7	101.8	100.1	102.0	97.0	102.9	96.1
1973	110.2	102.8	117.0	108.0	109.5	104.0	109.0	105.4
1974	109.8	106.4	112.3	111.3	105.1	107.0	106.5	110.1
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	110.7	105.8	111.1	108.5	102.0	108.0	108.0	112.4
1977	117.2	108.5	115.7	109.6	105.9	110.0	110.0	113.6
1978	124.0	112.4	122.9	111.5	110.3	112.0	113.0	115.8
1979	129.5	118.3	133.1	116.4	113.0	117.0	119.0	123.5
1980(r)	124.8	116.0	142.4	116.5	105.8	117.0	118.0	130.4
1981(r)	128.1	117.2	146.8	112.9	100.4	113.0	116.0	127.5
1982	117.7	105.1	144.3	110.5	101.3	112.0	111.0	124.1

r - Revised.

(a) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain comparibility of the series. Values are the unweighted means of the individual data of the original member countries.

Source: International Monetary Fund, "International Financial Statistics."



Consumer Prices

Average Annual Percent Change

1972-1982

CONSUMER PRICES
(1975 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1962	56.2	54.8	37.3	39.3	47.4	60.6	42.4	49.1
1963	56.9	55.7	40.2	40.1	49.9	62.4	45.6	50.5
1964	57.6	56.8	41.7	41.4	51.4	63.8	48.3	52.2
1965	58.6	58.1	44.5	43.3	52.8	65.9	50.4	54.9
1966	60.4	60.3	46.7	45.0	54.2	68.2	51.6	58.4
1967	62.0	62.5	48.6	46.2	55.7	69.3	53.5	60.9
1968	64.6	65.0	51.2	48.4	58.2	70.5	54.3	62.1
1969	68.1	67.9	53.9	51.0	61.8	71.8	55.7	63.7
1970	72.1	70.2	58.0	54.2	65.4	74.2	58.4	68.2
1971	75.2	72.2	61.6	59.3	69.0	78.2	61.3	73.3
1972	77.7	75.7	64.3	63.6	73.3	82.5	64.8	77.7
1973	82.6	81.4	71.9	69.4	78.7	88.2	71.8	82.9
1974	91.6	90.3	89.4	80.5	89.5	94.4	85.5	91.1
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	105.8	107.5	109.3	116.5	109.6	104.3	116.8	110.3
1977	112.7	116.1	118.1	135.0	119.9	108.1	136.7	122.9
1978	121.2	126.5	122.6	146.2	13[illegible].8	111.1	153.3	135.1
1979	134.9	138.1	127.0	165.8	144.8	115.6	175.9	144.9
1980	153.1	152.1	137.2	195.6	164.1	122.0	213.2	164.7
1981	169.0	171.0	143.9	218.8	186.0	129.2	251.2	184.7
1982	174.2	189.5	147.8	237.7	208.6	136.0	292.5	200.4

Source: International Monetary Fund, "International Financial Statistics."

WHOLESALE PRICES
(1975 = 100)

Year	United States	Canada	Japan	United Kingdom(a)	France(b)	West Germany	Italy	Sweden(c)
1962	54.2	48.8	55.8	40.9	52.4	66.3	41.5	NA
1963	54.0	49.8	56.7	41.3	53.9	66.6	43.7	NA
1964	54.1	49.9	56.9	42.6	55.8	67.4	45.0	NA
1965	55.2	51.0	57.3	44.1	56.2	69.0	45.8	NA
1966	57.1	52.8	58.7	45.4	57.8	70.3	46.5	NA
1967	57.2	53.7	59.7	46.8	57.3	69.6	46.4	NA
1968	58.6	54.9	60.3	48.7	56.3	69.1	46.7	57.0
1969	60.9	57.4	61.5	50.5	62.3	70.3	48.4	59.0
1970	63.1	58.3	63.8	54.1	67.0	73.8	52.0	63.0
1971	65.2	59.0	63.3	59.0	68.4	77.0	53.7	65.0
1972	68.1	63.1	63.8	62.1	71.6	79.0	55.9	68.0
1973	77.0	75.5	73.9	68.7	82.1	84.2	65.5	75.0
.974	91.5	89.9	97.1	81.8	106.0	95.6	92.2	94.0
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	104.6	105.1	105.0	117.3	107.4	103.7	123.6	109.0
1977	111.0	113.4	107.0	140.5	113.4	106.5	144.3	119.0
1978	119.7	123.9	104.3	153.3	118.3	107.8	156.4	128.0
1979	134.7	141.8	111.9	172.0	134.0	113.0	180.7	144.0
1980	153.6	160.9	131.8	200.0	145.8	121.5	217.0	164.0
1981	167.5	177.2	134.1	221.3	161.8	130.9	253.0	183.0
1982	171.1	187.9	136.0	240.2	179.8	138.6	288.2	205.0

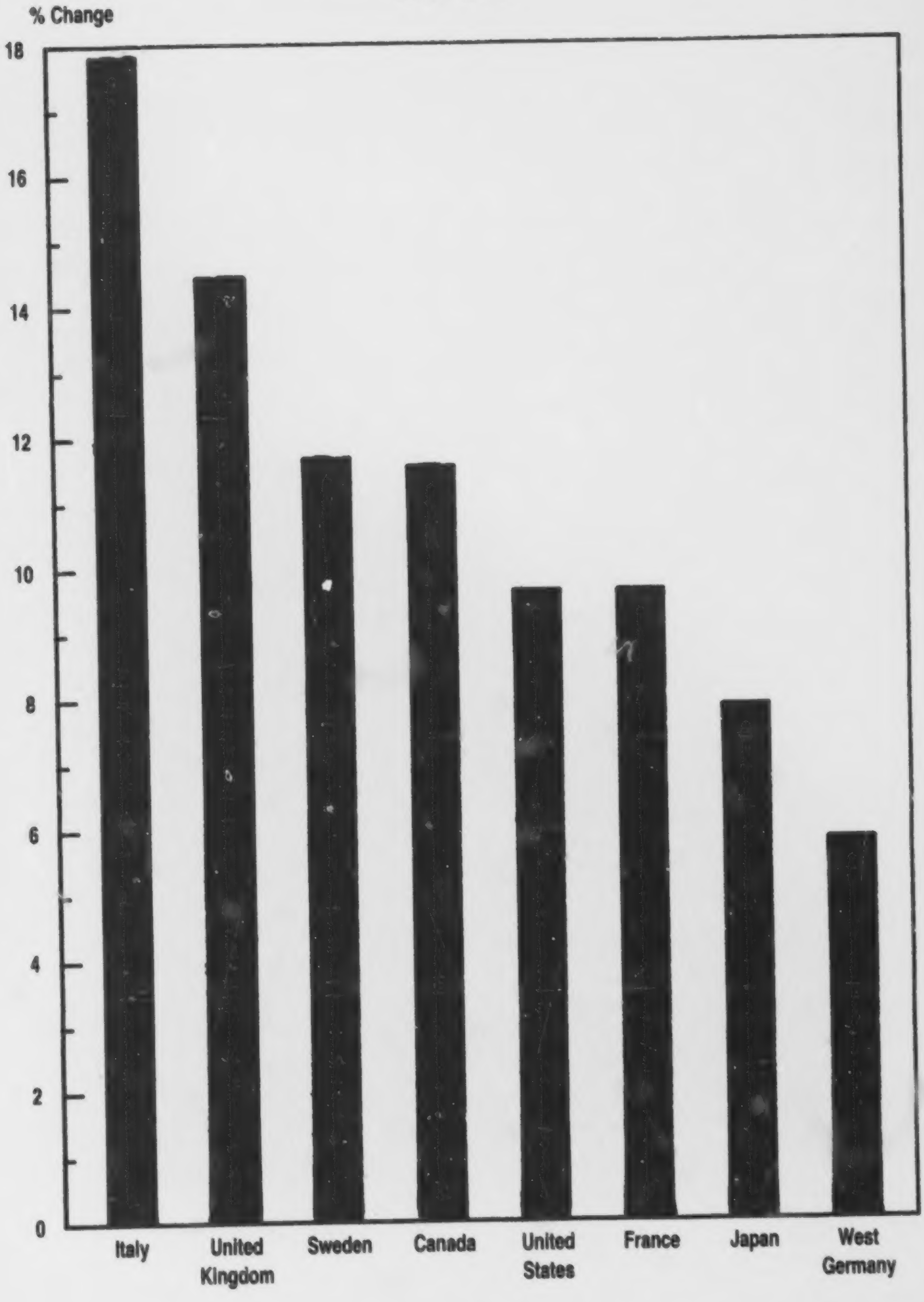
(a) Industrial output prices.
(b) Industrial goods prices.
(c) Domestic supply prices.

Source: International Monetary Fund, "International Financial Statistics."

Wholesale Prices

Average Annual Percent Change

1972-1982



UNIT VALUE OF EXPORTS
(1975 = 100)

Year	United States	Canada	Japan	EEC(b)	United Kingdom	France	West Germany	Italy
1966	50.3	52.1	59.2	46.5	41.8	54.7	65.8	45.0
1967	51.3	53.0	61.6	46.5	42.5	54.3	65.1	45.4
1968	52.0	54.3	61.2	48.0	45.8	53.9	64.3	45.2
1969	53.7	55.5	63.7	47.4	47.3	57.9	65.3	47.2
1970	56.7	57.3	67.2	50.2	52.5	63.9	70.8	49.0
1971	58.6	57.7	67.9	52.6	55.4	67.6	73.6	51.6
1972	60.3	59.6	66.7	58.6	58.7	68.3	75.7	53.2
1973	70.4	68.1	71.7	71.1	64.8	75.1	79.3	62.2
1974	89.4	90.3	98.3	88.3	81.8	94.7	92.1	88.2
1975	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1976	103.3	102.4	98.7	108.9	119.7	109.1	104.1	120.4
1977	107.1	109.0	98.4	116.9	141.6	119.9	105.2	144.3
1978(r)	114.5	118.6	92.4	119.9	155.2	126.0	105.2	154.4
1979(r)	130.2	143.4	102.3	133.0	171.4	138.2	108.4	181.6
1980(r)	147.9	168.1	114.4	151.1	192.6	153.3	116.0	220.1
1981(r)	161.5	178.9	117.9	173.2	206.9	173.2	124.8	269.0
1982	163.3	180.7	125.2	193.8	221.1	197.8	131.5	311.9

r - Revised.

(a) Data for the European Economic Community (EEC) on this table contains statistics for only the original six member countries in order to maintain compatibility of the time series.

Source: International Monetary Fund, "International Financial Statistics."

SOVIET UNION FOREIGN TRADE (a)
(Millions of U.S. Dollars)

	Exports			Imports		
Year	Total	Communist Countries (b)	Noncommunist Countries	Total	Communist Countries (b)	Noncommunist Countries
1963	$ 7,272	$ 5,099	$ 2,173	$ 7,059	$ 4,988	$ 2,072
1964	7,683	5,407	2,276	7,737	5,346	2,390
1965	8,175	5,556	2,618	8,058	5,610	2,448
1966	8,841	5,873	2,968	7,913	5,264	2,649
1967	9,652	6,377	3,275	8,537	5,946	2,591
1968	10,634	7,134	3,500	9,410	6,367	3,043
1969	11,655	7,682	3,973	10,327	6,696	3,631
1970	12,800	8,367	4,433	11,732	7,636	4,095
1971	15,916	10,398	4,788	14,388	9,432	4,302
1972	16,312	10,608	6,768	17,049	10,913	6,216
1973	21,175	12,215	8,978	20,825	12,351	8,442
1974	27,374	14,641	12,733	24,861	13,601	11,260
1975	33,407	20,271	13,136	37,072	19,415	17,657
1976	37,550	22,040	15,510	38,542	20,246	18,296
1977	45,094	25,901	19,193	40,806	23,284	17,521
1978	52,432	31,244	21,188	50,798	30,494	20,305
1979	64,913	36,152	28,761	57,961	32,801	25,160
1980	76,470	41,463	35,007	68,477	36,424	32,052
1981(r)	78,809	43,044	35,764	72,631	36,905	35,727
1982(p)	86,940	46,985	39,955	77,644	42,415	35,229

p - Preliminary. r - Revised.

(a) Exports and imports are F.O.B.

(b) Up to 1980, the following are included in the Communist Countries category: Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, China, and Mongolian People's Republic. After 1980 the following are included in the category: Bulgaria, China, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Korea, Laos, Mongolian People's Republic, Vietnam, and Yugoslavia.

Source: U.S. Department of Commerce, "Overseas Business Reports."

WORLD TRADE (a)

(Billions of U.S. Dollars)

	1979(r)		1980(r)		1981(r)		1982(p)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
United States(b)	$ 182	$ 222	$ 221	$ 257	$ 234	$ 273	$ 213	$ 261
Canada	58	57	68	63	73	70	71	61
Japan	102	110	130	141	152	143	140	132
European Community	577	611	666	729	613	644	599	628
United Kingdom	86	100	110	116	103	102	96	100
France	101	107	116	135	106	121	96	117
West Germany	172	160	193	188	176	164	176	155
Italy	72	78	78	100	75	91	77	91
Other developed	166	183	199	237	188	228	176	208
Less developed	453	408	609	540	606	595	526	562
OPEC	214	100	301	137	276	162	213	164
Other	239	308	308	403	330	433	313	399
Communist	170	171	203	203	213	211	216	209
Total(c)	$1,709	$1,762	$2,096	$2,170	$2,078	$2,165	$1,941	$2,062

p - Preliminary. r - Revised.

(a) Import values are cost, insurance, and freight.
(b) Exports include Department of Defense shipments.
(c) Individual items may not add to totals due to rounding.

Source: "Economic Report of the President", February 1983.

These figures show exports and imports of merchandise only.

U.S. TRADE WITH COMMUNIST COUNTRIES (a,c)

(Millions of U.S. Dollars)

	U.S. Exports			U.S. Imports		
	To Eastern Europe (b)	To USSR	To People's Republic of China	From Eastern Europe (b)	From USSR	From People's Republic of China
1961	$ 87.9	$ 45.7	Z	$ 57.9	$ 23.2	$ 0.4
1962	105.1	20.2	Z	62.6	16.3	0.2
1963	143.9	22.9	Z	60.3	21.2	0.3
1964	193.6	146.4	Z	77.8	20.7	0.5
1965	94.8	45.2	Z	94.8	42.6	0.5
1966	156.0	41.7	Z	129.1	49.6	0.1
1967	135.0	60.3	Z	136.1	41.2	0.2
1968	157.3	57.7	Z	140.0	58.5	Z
1969	143.7	105.5	Z	144.0	51.5	Z
1970	234.9	118.7	Z	153.5	72.3	Z
1971	222.2	162.0	Z	165.8	57.2	4.9
1972	276.9	542.2	$ 63.5	225.0	95.5	32.4
1973	606.5	1,194.7	689.6	306.1	220.1	64.9
1974	823.4	609.2	807.4	539.4	350.4	114.7
1975	951.0	1,836.9	303.8	472.9	255.3	157.4
1976	1,189.7	2,305.9	135.4	646.2	220.6	201.9
1977	911.9	1,623.5	171.3	683.7	234.3	202.7
1978	1,420.2	2,249.0	818.2	969.8	540.4	324.0
1979	2,0[illegible]6.2	3,603.6	1,716.5	998.8	873.2	592.3
1980	2,339.6	1,509.7	3,749.0	982.0	452.9	1,058.3
1981	1,904.2	2,338.6	3,598.6	1,206.7	347.4	1,895.3
1982	1,012.8	2,583.7	2,912.1	839.4	227.6	2,283.7

Z - Less than $50,000.

(a) Exports and imports are f.a.s. transaction values, except prior to 1974, where imports are customs values.
(b) Does not include Yugoslavia.
(c) Data for 1978 to the present are not directly comparable to prior years due to commodity schedule changes.

Source: U.S. Department of Commerce; "Overseas Business Reports."

BALANCE OF TRADE AND PAYMENTS
(Billions of U.S. Dollars)

	Balance of Trade (a)	Balance on Current Account (b)
United States (c)		
1980(r)	$ -36.2	$ 1.5
1981(r)	-39.6	4.2
1982E	-48.5	-8.8
Canada		
1980(r)	4.9	-0.9
1981(r)	2.6	-4.4
1982E	10.3	-1.0
Japan		
1980	-10.9	-10.7
1981(r)	3.6	5.1
1982E	8.3	6.5
United Kingdom		
1980(r)	-5.7	6.9
1981(r)	0.7	12.4
1982E	-4.6	4.5
France		
1980(r)	-18.9	-3.6
1981(r)	-14.5	-3.0
1982E	-20.2	-11.5
West Germany		
1980	4.9	-16.4
1981(r)	12.2	-7.1
1982(r)	20.8	-0.3
Italy		
1980(r)	-21.8	-9.8
1981(r)	-15.8	-8.5
1982E	-13.2	-5.5

r - Revised. E Estimate.

(a) Balance of payments basis.
(b) Net exports of goods and services and unilateral transfers.
(c) Refer to Chapter 1 for historical chart of the United States balance of trade.

Source: "Economic Report of the President", February 1983.

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS IN MANUFACTURING
For Selected Years
(U.S. Dollars)

	1970	1975(r)	1979(r)	1980(r)	1981(r)	1982	Percent Increase 1975-1982
United States	$4.20	$6.35	$9.07	$9.91	$10.96	$11.79	86%
Canada	3.46	6.11	8.16	8.98	9.87	10.77	76
United Kingdom	1.46	3.26	5.49	7.29	7.12	6.67	105
France	1.74	4.58	7.90	9.24	8.32	8.15	78
West Germany	2.32	6.19	11.26	12.30	10.54	10.43	68
Italy	1.75	4.60	7.20	8.17	7.48	7.39	61
Sweden	2.96	7.18	11.33	12.51	11.80	10.33	44
Japan	.99	3.05	5.49	5.61	6.18	5.82	91

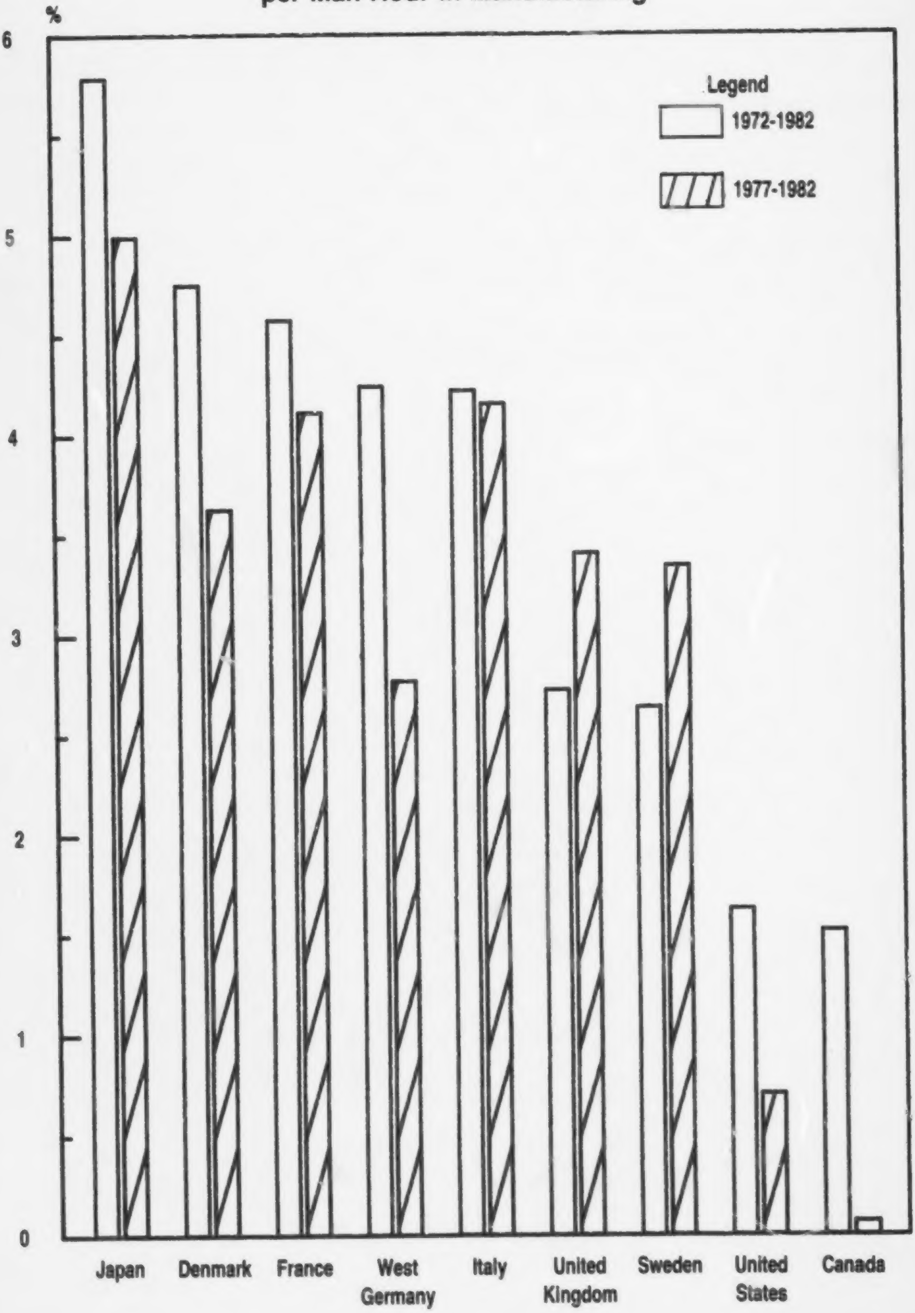
r - Revised.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

For international comparisons of compensation in the machine tool industry, see Chapter 7.

Productivity

Average Annual Increase in Output per Man-Hour in Manufacturing



]

PRODUCTIVITY IN MANUFACTURING (r)
Selected Countries 1964 to Date
Indexes: 1977 = 100

	United States	Canada	Japan	France	West Germany	Italy	United Kingdom
Unit Labor Cost (a)							
1964	58.1	50.4	34.6	48.1	31.8	42.9	48.6
1965	57.5	51.0	37.4	49.0	32.7	41.2	51.7
1966	59.4	53.3	37.4	48.8	34.2	40.4	54.1
1967	62.4	55.5	36.5	49.9	33.9	42.5	52.5
1968	64.6	55.8	37.9	50.5	33.7	42.0	45.7
1969	68.0	56.7	39.1	48.3	35.1	44.3	48.6
1970	72.7	62.0	41.3	48.3	43.2	50.6	55.0
1971	72.7	64.4	46.4	51.4	48.9	57.5	62.0
1972	73.0	67.4	55.2	59.1	55.4	64.5	66.6
1973	74.2	69.2	68.6	72.8	71.0	73.1	68.4
1974	84.1	80.1	81.7	77.6	79.5	77.6	81.1
1975	91.5	90.3	90.4	100.6	89.2	104.3	101.9
1976	94.6	101.0	88.2	95.2	87.6	90.5	93.3
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	107.4	97.8	126.2	116.5	121.6	115.6	124.0
1979	117.0	101.8	117.9	133.6	136.2	129.5	157.9
1980	130.6	114.9	113.8	151.7	147.5	141.4	212.7
1981	140.0	123.5	123.8	134.0	124.2	126.2	203.3
1982	153.4	136.9	112.0	122.0	119.5	122.9	185.1
Hourly Compensation (a)							
1964	42.0	30.6	11.0	23.3	16.1	20.4	31.6
1965	42.8	32.1	12.4	25.1	17.6	21.8	34.7
1966	44.8	34.6	13.6	26.7	19.0	22.8	37.6
1967	47.0	37.3	15.3	28.9	20.1	25.4	38.2
1968	50.4	40.0	17.9	32.5	21.3	27.1	35.6
1969	53.9	43.0	21.3	32.2	23.6	30.7	38.8
1970	57.6	47.8	25.4	33.8	29.5	36.8	44.3
1971	61.1	53.1	30.3	37.9	34.7	43.1	51.8
1972	64.4	58.1	40.1	46.3	42.0	52.3	60.0
1973	69.0	63.4	55.0	60.0	56.9	66.4	65.5
1974	76.3	75.0	67.1	66.2	67.1	74.0	78.2
1975	85.4	82.4	77.1	88.4	79.4	95.0	96.5
1976	92.3	97.1	82.3	90.5	83.5	89.5	91.8
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	108.3	99.4	136.1	123.2	125.6	119.1	128.1
1979	118.8	106.6	138.5	148.0	147.5	143.1	168.7
1980	132.9	117.5	142.6	170.7	162.0	165.3	229.9
1981	146.5	127.4	156.4	153.2	140.1	152.7	232.3
1982	158.9	137.4	142.9	149.2	137.1	150.6	218.7
Output Per Man Hour (Productivity)							
1964	72.3	60.6	31.8	48.4	50.5	47.6	64.9
1965	74.5	62.9	33.1	51.2	53.8	52.9	67.0
1966	75.3	65.1	36.5	54.8	55.7	56.4	69.5
1967	75.3	67.1	41.9	57.8	59.4	59.7	72.7
1968	78.0	71.7	47.1	64.4	63.4	64.5	78.0
1969	79.3	75.9	54.5	66.9	67.1	69.4	79.9
1970	79.1	77.0	61.4	70.1	68.2	72.7	80.5
1971	83.9	82.5	65.3	73.8	71.0	74.9	83.7
1972	88.2	86.2	72.7	78.2	75.7	81.1	30.2
1973	93.0	91.6	80.2	82.4	80.1	90.9	95.8
1974	90.8	93.6	82.1	85.3	84.5	95.3	96.5
1975	93.4	91.2	85.3	87.9	69.0	91.1	94.6
1976	97.5	96.1	93.3	95.1	95.3	98.9	98.4
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.8	101.7	107.9	105.7	103.3	103.0	103.3
1979	101.5	104.7	117.4	110.7	108.3	110.5	106.8
1980	101.7	102.3	125.4	112.6	109.8	116.9	108.1
1981	104.6	103.1	126.3	114.4	112.8	119.2	114.2
1982	103.6	100.3	127.6	122.3	114.7	122.6	118.2

r - Revised.

(a) U.S. dollar basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

COST RECOVERY ALLOWABLE FOR TAX PURPOSES ON MACHINERY AND EQUIPMENT

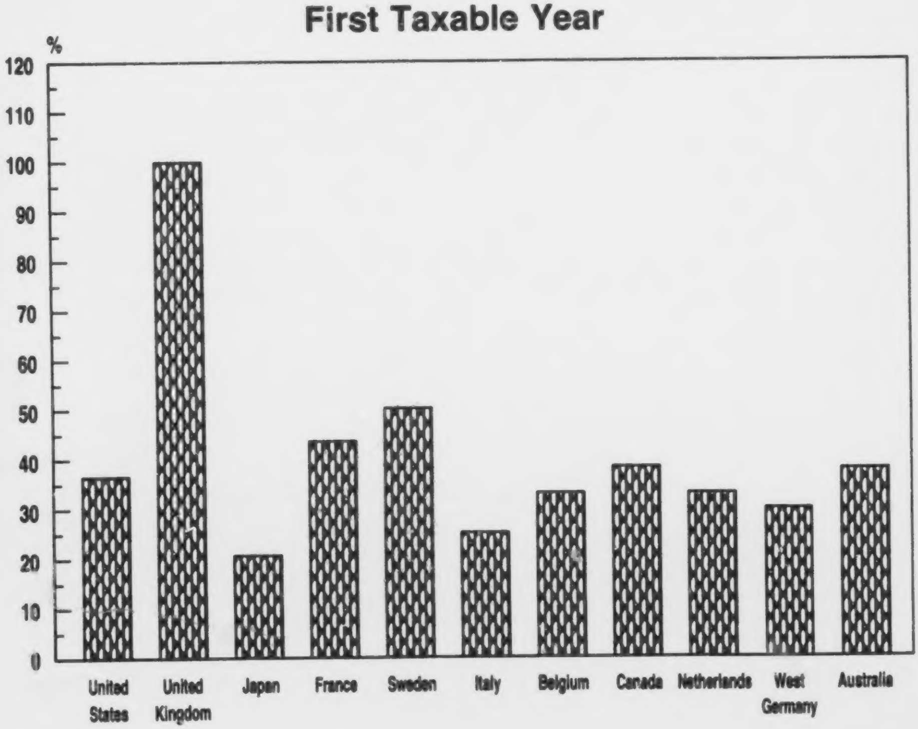
(Percent of Original Cost)

Country	First Year	Third Year	Seventh Year
U. S.	36.7	79.7	121.7
United Kingdom	100.0	100.0	100.0
Japan	20.6	50.0	80.1
France	43.8	73.4	95.8
Sweden	50.0	85.7	120.0
Italy	25.0	75.0	100.0
Belgium	33.0	61.8	102.0
Canada	38.4	108.2	108.2
Netherlands	33.1	53.1	93.1
West Germany	30.0	65.7	91.7
Australia	38.0	78.0	118.0

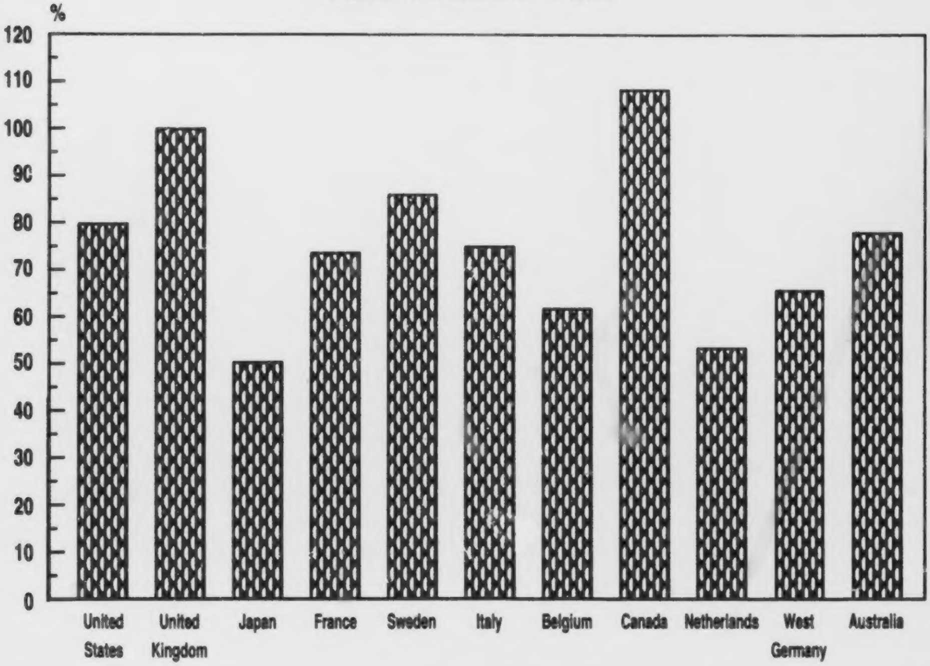
Note: These capital cost recovery allowances are based on statutory or other published provisions of law. As such they do not reflect informal or ad hoc arrangements that are frequently available in foreign countries - but not in the U.S. - to increase the rate of cost recovery actually allowed to industrial producers in those countries.

Source: Report of the President's Task Force on Business Taxation, September 1970, pages 28-29 updated by Price Waterhouse & Company. The most recent data is for the year 1982.

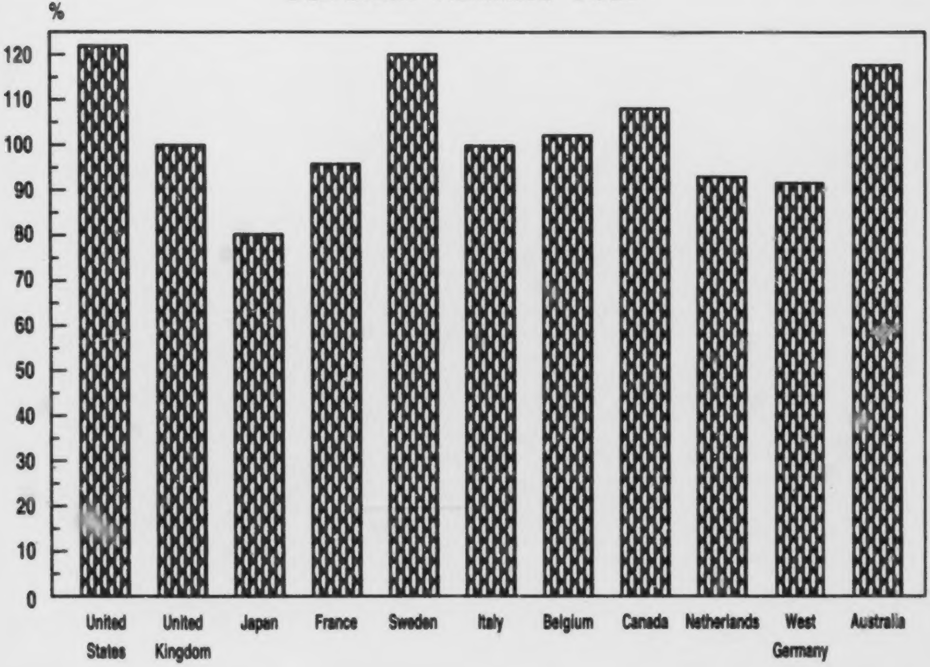
Cost recovery allowable for tax purposes includes depreciation as well as any tax credits. Where credits are available, total allowable cost recovery exceeds 100% of the original purchase cost. The rate of depreciation determines how quickly these costs are recovered. The percent values as stated are based on accelerated depreciation rates applicable in each country. At the end of the depreciation period, the taxable profits of the enterprise will have been reduced by the allowable cost recovery. The actual tax savings will depend on the tax rate prevailing in the specific country.



Third Taxable Year



Seventh Taxable Year



FEDERAL, STATE AND LOCAL TAX REVENUES AS PERCENT OF GNP, 1980

Selected Countries

Country	Total	Sales & Excise (a)	Social Security Total (b)	Corporate Income	Non-Corporate Income (b)	Other (d)
Belgium	43.9	10.8	13.5	2.5	15.5	1.7
Canada	34.5	8.4	3.6	3.9	11.8	6.9
Denmark	46.8	16.6	0.8	1.5	24.0	3.8
France	42.3	12.3	18.3	2.1	5.5	4.1
Italy	32.2	8.4	11.5	2.7	8.0	1.6
Japan	26.4	3.7	7.7	4.6	6.4	4.1
Luxembourg	36.4	6.9	11.0	6.0	10.0	2.5
Netherlands	46.0	10.4	17.5	3.0	12.1	2.8
Sweden	50.1	11.5	14.3	1.2	20.5	2.5
Switzerland	29.5	5.6	9.1	1.7	10.5	2.6
United Kingdom	36.0	9.8	6.1	2.8	10.8	6.6
United States	29.5	4.3	7.8	3.0	10.8	3.6
West Germany	37.5	9.7	12.8	2.1	11.2	1.7

(a) Includes general sales, value added, and specific excise taxes.

(b) Includes contributions of employers, employees, and self-employed.

(c) Includes income taxes on individual and unincorporated enterprise.

(d) Includes taxes on net wealth and immovable property, taxes and stamp duties on gifts, inheritances, etc.

Source: "Revenue Statistics of OECD Member Countries, 1969-1980."

SOCIAL SECURITY TAX REVENUES AS PERCENT OF GNP, 1980

Selected Countries

Country	Total (a)	Employees	Employees	Self-Employed and Other
Belgium	13.5	3.8	8.6	1.1
Canada	3.6	NA	NA	NA
Denmark	0.8	0.5	0.4	NA
France	18.3	4.8	12.3	1.2
Italy	11.5	1.9	7.2	2.5
Japan	7.7	2.7	3.9	1.1
Luxembourg	11.0	4.3	6.1	0.7
Netherlands	17.5	7.2	8.2	2.2
Sweden	14.3	NA	13.7	0.6
Switzerland	9.1	3.1	3.1	2.9
United Kingdom	6.1	2.4	3.6	0.1
United States	7.8	3.0	4.6	0.2
West Germany	12.8	5.8	6.8	0.2

NA - Not Available.

(a) The category is broadly defined to include all tax payments to institutions of general government providing social welfare benefits, provided they are levied as a function of pay or as a fixed amount per person. Thus, for the United States, this category includes contributions to the railroad retirement fund, unemployment insurance fund workmen's compensation fund, and civil service retirement program in addition, of course, to the more familiar social security payments made pursuant to the Federal Insurance Contributions Act (FICA).

Source: "Revenue Statistics of OECD Member Countries, 1969-1980."

3

U. S. MACHINE TOOL INDUSTRY

The "Machine Tool Industry" actually consists of two industries according to the government's Standard Industrial Classification system (SIC); Metal Cutting Machine Tools (SIC 3541) and Metal Forming Machine Tools (SIC 3542).

The distinction between "industries" and "products" should be clearly kept in mind to avoid confusion in studying the statistical data in this Handbook. In brief, the machine tool industry produces not only machine tools but other products. The reverse of this is also true—not all machine tools are produced by the machine tool industry—some other industries also produce machine tools.

The machine tool industry is made up of the establishments whose "primary products" are machine tools. Data on shipments by the machine tool industry covers the totality of the shipments of the establishments in the industry. This means that not only the machine tools but also "secondary products"—products that are generally produced by other industries—are covered. Such secondary products may be tooling, machine tool accessories, abrasive products, wood- or plastic-working machines, or a variety of other products.

To measure the degree to which an industry produces its primary and secondary products, the Census Bureau has developed a "primary specialization ratio" which describes the proportion of total product shipments that are "primary products." For the metal cutting industry, this specialization ratio was 87%, for 1977. This means that 87% of the products shipped by this industry were metal cutting machine tools and 13% were products other than metalcutting machine tools. For metal forming, the corresponding figures are 90% and 10%.

The Bureau of the Census reports not only "industry" totals but also "product" totals. To obtain a product total, it adds to the machine tools produced by the machine tool industry all the machine tools produced by other industries as secondary products.

In addition to the industry specialization ratio described above, the Census has developed a ratio to describe the proportion of primary products produced by the establishments classified in the industry to total shipments of such products by all manufacturing establishments. This ratio is called the "coverage ratio." In 1977, the coverage ratio in metal cutting was 92%, in metal forming 87%. This means that the metal cutting industry produced 92% of all metal cutting machine tools produced in the U.S., the metal forming industry 87% of all American metal forming machine tools.

The data in Chapter 3 deal exclusively with the machine tool INDUSTRY. Chapter 4 deals with PRODUCTS—total machine tool orders and shipments. As already indicated, industry data are based on the Standard Industrial Classification system. This system was developed to classify establishments by type of activity—it covers the entire field of economic activities. The system is structured by digits. The first two digits identify the major industry group, the third digit identifies the industry group, and the fourth digit identifies the industry. The fifth, sixth, and seventh digits are used to define product classes (fifth) and individual products (sixth and seventh). For example:

Industries	Major Group 35:	Machinery, Except Electrical
	Group 354:	Metalworking Machinery, and Equipment
	Industry 3541:	Machine Tools, Metal Cutting Types
Products	Product Class 35413:	Gear Cutting Machines
	Product 3541371:	Gear Tooth Finishing Machines

Size of the Industry

The machine tool industry is relatively small compared to other U.S. industries. Many of the larger industrial corporations have more employees and a higher value of product shipments than the entire machine tool industry.

If the entire machine tool industry were combined into one firm, its sales would rank 104th on the 1982 "Fortune 500" of America's largest manufacturing companies. Currently, as a result of the recession, the industry's employment has fallen to around 65,000 people, a level substantially below the Spring 1980 level of over 110,000 employees.

While the most recent Census of Manufactures (1977) reports more than 1,300 establishments in SIC 3541 and SIC 3542, estimates by the NMTBA and Census Bureau indicate that approximately 40% of these plants primarily manufacture machine tool accessories, dies, tools, jigs and fixtures rather than machine tools. According to the 1977 Census, two-thirds of these establishments had fewer than 20 employees.

Location of the Industry

During the 19th century, the machine tool industry was located almost entirely in New England. Its center moved southward into the Middle Atlantic States and Pennsylvania and then west into Ohio and other parts of the Middle West as the 1800's drew to a close. Development and growth were closely related to the growth of other industries such as textile machinery, small arms, watches and clocks, ships, railroads, farm machinery, and bicycles. By 1900, Cincinnati had become the leading machine tool center, Philadelphia was second, Providence, R.I., third. In the 1920's the rapid growth of the automobile industry accounted for the rapid growth of machine tool production in Michigan and Illinois. The decline of Pennsylvania as a machine tool producer was closely related to the decline of the locomotive. Today, the leading metal cutting machine tool producing states are Ohio, Michigan, Illinois, Connecticut, New York and Wisconsin, and the leading metal forming machine tool producers are Illinois, Ohio, Michigan, New York, and Connecticut.

Sources of Industry Data

Data on the machine tool industry comes from the Census of Manufactures (which takes place every five years) and the Annual Survey of Manufactures. The Census is based on reports from individual establishments and is very detailed. However, the Census suffers from several shortcomings. It focuses primarily on large establishments, thus data on smaller establishments are less reliable. Also, the Census is published with a considerable time lag. Because 1977 was a Census year and because of the time lag in the publication of the Census data, many of the charts and tables in this chapter were previously published using preliminary Census statistics. The final Census data were published in early 1981 and all charts and tables citing the Census have been revised to reflect these final statistics.

In general, the industry finds that its own data, and those released quarterly by the government as "Current Industrial Reports" (MQ-35W), are more useful and timely. The main value of the 5-year Census lies in the broader coverage and in the fact that shipment, employment, compensation, and other data are all available for the same population. This permits the calculation of ratios otherwise not available. The Annual Survey of Manufactures is based on sample surveys and covers fewer items than the Census. It is also published with a considerable delay between the time of data collection and distribution.

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1958 to Date

Year	Establishments		Employees (Number)	Value Added by Manufacture	Cost of Materials	Value of Shipments
	Total	With 20 or More Employees		(Millions of Dollars)		
TOTAL INDUSTRY, SIC 3541 and 3542						
1958	918	378	75,366	$ 597.0	$ 347.8	$ 997.5
1959	NA	NA	75,091	737.4	403.3	1,111.5
1960	NA	NA	81,200	815.8	468.7	1,265.7
1961	NA	NA	78,108	771.8	456.4	1,241.9
1962	NA	NA	82,251	936.8	513.7	1,430.3
1963	1,167	415	83,136	980.6	547.0	1,502.2
1964	NA	NA	88,079	1,154.7	678.7	1,790.7
1965	NA	NA	96,344	1,342.6	813.5	2,107.2
1966	NA	NA	108,174	1,666.3	981.3	2,553.8
1967	1,253	506	116,400	1,828.5	1,062.3	2,841.2
1968	NA	NA	112,200	1,830.4	988.9	2,817.3
1969	NA	NA	110,600	1,894.6	1,034.7	2,834.8
1970	NA	NA	100,200	1,581.7	992.6	2,597.8
1971	NA	NA	78,400	1,183.7	751.2	2,018.8
1972	1,277	437	76,600	1,319.4	821.6	2,111.7
1973	NA	NA	86,900	1,760.6	1,134.9	2,777.3
1974	NA	NA	94,000	2,250.7	1,523.3	3,579.8
1975	NA	NA	88,800	2,258.6	1,533.5	3,834.4
1976	NA	NA	81,000	2,285.2	1,286.2	3,566.9
1977	1,343	469	83,200	2,592.9	1,493.6	3,949.7
1978	NA	NA	89,500	3,108.3	1,994.1	4,977.8
1979	NA	NA	96,100	3,837.8	2,423.9	6,052.5
1980	NA	NA	99,700	4,391.3	2,744.6	6,960.7
1981(p)	NA	NA	98,300	4,716.4	2,850.0	7,481.0

NA - Not available. p - Preliminary.

(a) The machine tool industry (Standard Industrial Classification SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures".

THE MACHINE TOOL INDUSTRY (a)
General Statistics 1958 to Date
Metal Cutting and Metal Forming

Year	Establishments: Total	Establishments: With 20 or More Employees	Employees (Number)	Value Added by Manufacture (Millions of Dollars)	Cost of Materials (Millions of Dollars)	Value of Shipments (Millions of Dollars)
METAL CUTTING MACHINE TOOL INDUSTRY, SIC 3541						
1958	627	231	52,864	$ 421.0	$ 217.7	$ 679.8
1962	NA	NA	58,855	671.0	333.0	982.1
1963	801	269	61,058	699.3	381.6	1,050.8
1965	NA	NA	70,827	993.6	559.2	1,524.4
1966	NA	NA	79,767	1,234.2	669.4	1,826.1
1967	903	338	87,200	1,391.3	766.9	2,127.2
1968	NA	NA	84,300	1,377.1	718.9	2,099.1
1969	NA	NA	82,600	1,441.5	744.5	2,108.3
1970	NA	NA	71,300	1,112.1	664.0	1,821.7
1971	NA	NA	54,000	819.8	473.2	1,351.1
1972	894	275	52,500	901.7	536.3	1,418.1
1973	NA	NA	59,900	1,214.1	764.1	1,891.1
1974	NA	NA	65,000	1,617.0	1,017.9	2,480.5
1975	NA	NA	62,800	1,640.3	1,050.3	2,727.8
1976	NA	NA	58,100	1,664.1	852.3	2,496.2
1977	917	306	59,500	1,871.0	1,049.6	2,819.1
1978	NA	NA	64,300	2,267.0	1,417.7	3,611.8
1979	NA	NA	69,100	2,833.8	1,736.9	4,389.0
1980	NA	NA	72,800	3,349.2	2,026.1	5,227.6
1981(p)	NA	NA	74,300	3,739.9	2,187.3	5,865.3
METAL FORMING MACHINE TOOL INDUSTRY, SIC 3542						
1958	291	147	22,502	$ 176.0	$ 130.1	$ 317.7
1962	NA	NA	23,396	265.8	180.7	448.2
1963	366	146	22,078	281.3	165.4	441.4
1965	NA	NA	25,517	349.0	254.3	582.8
1966	NA	NA	28,407	432.1	311.9	727.7
1967	350	166	29,200	437.2	295.4	714.0
1968	NA	NA	27,900	453.3	270.0	718.2
1969	NA	NA	26,000	453.1	290.2	726.5
1970	NA	NA	28,900	469.6	328.6	776.1
1971	NA	NA	24,400	363.9	278.0	667.7
1972	383	162	24,100	417.7	285.3	693.6
1973	NA	NA	27,000	546.5	370.8	886.2
1974	NA	NA	29,000	633.7	505.4	1,099.3
1975	NA	NA	26,000	618.3	483.2	1,106.6
1976	NA	NA	22,900	621.1	433.9	1,070.7
1977	426	163	23,700	721.9	444.0	1,130.6
1978	NA	NA	25,200	841.3	576.4	1,356.0
1979	NA	NA	27,000	1,004.0	687.0	1,663.5
1980	NA	NA	26,900	1,042.1	718.5	1,753.1
1981(p)	NA	NA	24,000	976.5	662.7	1,615.7

NA - Not Available. p - Preliminary.

(a) The machine tool industry (Standard Industrial Classifications SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures".

LOCATION OF THE MACHINE TOOL INDUSTRY (c)

Establishments, Employees, Value Added, Shipments, by Region

1958 to 1977

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. TOTAL					
1958	918	378	75,366	$ 597	$ 998
1963	1,167	415	83,136	980	1,502
1967	1,253	506	116,400	1,828	2,841
1972	1,277	437	76,600	1,319	2,114
1977	1,343	469	83,200	2,593	3,950
NEW ENGLAND					
1958	122	60	14,376	106	171
1963	150	52	16,934	183	273
1967	149	68	25,300	366	550
1972	140	52	2,000(a)	32(a)	48(a)
1977	155	56	D	D	D
MIDDLE ATLANTIC					
1958	176	60	11,095	82	131
1963	251	68	11,618	148	212
1967	239	71	13,400	215	299
1972	218	64	10,400	175	270
1977	197	57	7,000(b)	205(b)	286(b)
EAST NORTH CENTRAL					
1958	453	214	45,740	374	634
1963	545	239	49,415	592	926
1967	578	270	67,500	1,100	1,764
1972	620	240	45,500	793	1,308
1977	595	252	48,200	1,535	2,389
WEST NORTH CENTRAL					
1958	42	16	1,520	12	21
1963	44	16	1,085	11	16
1967	46	22	2,600	38	57
1972	50	25	2,400	43	65
1977	52	23	D	D	D
SOUTH					
1958	34	11	764	8	11
1963	47	12	1,068	13	19
1967	61	29	3,200	44	63
1972	82	21	1,000(a)	19(a)	30(a)
1977	40	12	975E	5(b)	7(b)
WEST					
1958	91	17	1,871	15	27
1963	130	28	3,016	35	55
1967	180	46	4,400	67	109
1972	168	36	2,000(a)	39(a)	64(a)
1977	162	40	3,000E	65(b)	96(b)

D - Withheld to avoid disclosure. E - Estimate.

(a) Includes metal forming data only, metal cutting data not given to avoid disclosure.

(b) Includes metal cutting data only, metal forming data withheld to avoid disclosure.

(c) Due to a change of methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1958 to 1977

	Establishments			Value Added by Manufacture	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. TOTAL					
1958	627	231	52,864	$ 421	$ 680
1963	801	269	61,058	699	1,061
1967	903	338	87,200	1,391	2,127
1972	894	275	52,500	902	1,418
1977	917	306	59,500	1,871	2,819
NEW ENGLAND					
1958	90	42	12,134	89	141
1963	111	39	14,853	160	238
1967	120	51	22,900	329	492
1972	109	40	D	D	D
1977	122	44	D	D	D
MIDDLE ATLANTIC					
1958	109	27	6,322	48	69
1963	163	40	7,106	89	120
1967	163	44	8,100	145	189
1972	145	35	6,500	115	166
1977	125	33	7,000	205	286
EAST NORTH CENTRAL					
1958	316	141	32,509	267	441
1963	387	161	36,845	425	662
1967	428	191	49,900	824	1,303
1972	438	154	31,000	538	875
1977	440	179	34,600	1,105	1,717
WEST NORTH CENTRAL					
1958	25	9	912	7	12
1963	24	11	547	5	8
1967	26	10	1,600	25	36
1972	29	13	1,500	27	41
1977	28	13	D	D	D
SOUTH					
1958	22	7	465	5	7
1963	26	4	463	6	9
1967	37	15	2,200	31	41
1972	52	12	D	D	D
1977	17	2	200	5	7
WEST					
1958	65	5	522	5	8
1963	90	14	1,244	15	24
1967	129	27	2,500	38	66
1972	121	21	D	D	D
1977	104	18	1,700	65	96

D - Withheld to avoid disclosure.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1958 to 1977

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. TOTAL					
1958	291	147	22,502	$ 176	$ 318
1963	366	146	22,076	281	441
1967	350	168	29,200	437	714
1972	383	162	24,100	418	696
1977	426	163	23,700	722	1,131
NEW ENGLAND					
1958	32	18	2,242	17	30
1963	39	13	2,081	23	35
1967	29	17	2,400	37	58
1972	31	12	2,000	32	48
1977	33	12	D	D	D
MIDDLE ATLANTIC					
1958	67	33	4,773	34	62
1963	88	28	4,512	59	92
1967	76	27	5,300	70	110
1972	73	29	3,900	60	104
1977	72	24	D	D	D
EAST NORTH CENTRAL					
1958	137	73	13,231	107	193
1963	158	78	12,570	167	264
1967	150	79	17,600	276	461
1972	182	86	14,500	256	433
1977	155	73	13,600	430	672
WEST NORTH CENTRAL					
1958	17	7	608	5	9
1963	20	5	538	6	8
1967	20	12	1,000	13	21
1972	21	12	900	16	24
1977	24	10	D	D	D
SOUTH					
1958	12	4	299	3	4
1963	21	8	605	7	10
1967	24	14	1,000	13	22
1972	30	9	1,000	19	30
1977	23	10	955E	D	D
WEST					
1958	26	12	1,349	10	19
1963	40	14	1,772	20	31
1967	51	19	1,900	29	43
1972	47	15	2,000	39	64
1977	58	22	1,300E	D	D

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35(C)" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1972 to 1977

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1972		
California	105	16	1,500	$ 24	$ 43
Connecticut	50	18	(c)	D	D
Florida	7	1	100	2	2
Illinois	111	36	6,400	114	177
Indiana	25	5	900	13	20
Kansas	3	2	100	2	3
Kentucky	8	2	200	2	5
Massachusetts	34	10	(c)	D	D
Michigan	171	56	7,400	169	279
Minnesota	9	4	600	9	14
Missouri	9	4	500	10	14
New Jersey	43	5	400	7	11
New York	65	21	4,700	84	122
Ohio	93	38	12,400	186	312
Pennsylvania	37	9	1,500	24	33
Rhode Island	14	6	(b)	D	D
Tennessee	5	2	(a)	D	D
Texas	10	5	(b)	D	D
Vermont	3	3	(c)	31	43
Wisconsin	38	19	3,900	56	87
STATE			1977		
California	95	16	1,500	$ 60	$ 89
Connecticut	46	18	4,600	148	234
Illinois	94	39	6,500	196	291
Indiana	25	8	1,400	39	57
Iowa	6	4	500	12	21
Massachusetts	37	10	2,200	66	92
Michigan	190	74	9,100	353	566
Minnesota	20	7	1,300	40	58
New Jersey	31	6	400	10	15
New York	52	16	4,700	148	204
Ohio	95	40	13,900	389	624
Pennsylvania	42	11	1,900	48	66
Rhode Island	20	7	2,400	62	82
Texas	17	2	200	5	7
Vermont	6	4	2,800	87	117
Washington	9	2	200	5	7
Wisconsin	36	18	3,700	128	18[illegible]

D - Withheld to avoid disclosure.

(a) 250-499 Employees.
(b) 1,000-2,499 Employees.
(c) 2,500 Employees and over.

Source: U.S. Bureau of the Census, "Census of Manufactures 1972, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1972 to 1977

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1972		
California	34	10	(c)	D	D
Connecticut	22	10	1,800	$ 29	$ 44
Florida	7	2	200	2	4
Georgia	3	2	(b)	D	D
Indiana	12	8	500	9	16
Illinois	53	28	6,100	91	173
Massachusetts	6	1	(a)	D	D
Michigan	62	23	2,600	50	86
Minnesota	7	4	400	8	11
Missouri	7	2	200	2	3
New Jersey	23	8	400	6	10
New York	29	13	2,300	37	61
North Carolina	3	1	(b)	D	D
Ohio	39	26	5,100	103	155
Pennsylvania	21	8	1,200	17	33
Texas	9	2	200	3	5
Washington	3	1	(b)	D	D
Wisconsin	9	1	100	2	3
STATE			1977		
California	47	16	1,100	$ 37	$ 62
Colorado	8	4	400	10	17
Connecticut	24	10	1,800	50	72
Illinois	52	25	6,400	177	276
Indiana	11	7	600	18	31
Kansas	5	3	300	7	12
Michigan	58	22	2,000	68	110
Missouri	12	6	300	5	8
New York	29	11	2,200	65	96
Ohio	34	19	4,600	167	255
Pennsylvania	19	7	900	37	59
Texas	10	4	200	4	6

D - Withheld to avoid disclosure.

(a) 150-249 Employees.
(b) 250-499 Employees.
(c) 1,000-2,499 Employees.

Source: U.S. Bureau of the Census, "Census of Manufactures 1972, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C" and earlier issues. See chapter introduction.

THE MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1958	1963	1967	1972	1977
Number of Companies	890	1,146	1,209	NA	NA
Number of Establishments	918	1,167	1,253	1,277	1,343
Number of Employees	75,366	83,136	116,400	76,600	83,100
1 to 4 Employees					
Establishments	273	375	336	380	434
Employees	571	714	500	800	800
5 to 9 Employees					
Establishments	140	191	189	212	252
Employees	964	1,295	1,300	1,500	1,700
10 to 19 Employees					
Establishments	127	186	222	248	178
Employees	1,738	2,612	3,100	3,400	2,400
20 to 49 Employees					
Establishments	153	182	218	194	219
Employees	4,903	5,643	6,500	6,000	6,700
50 to 99 Employees					
Establishments	77	96	111	89	98
Employees	5,356	6,455	7,700	6,200	6,700
100 to 249 Employees					
Establishments	79	67	79	83	75
Employees	12,666	10,620	12,700	12,500	11,500
250 to 499 Employees					
Establishments	31	31	43	37	41
Employees	10,900	11,249	15,100	12,600	14,800
500 to 999 Employees					
Establishments	26	22	30	24	27
Employees	20,875	15,583	21,400	17,600	21,700(a)
1000 to 2499 Employees					
Establishments	11	14	22	8	8
Employees	17,393	19,236	35,500	16,200(b)	16,600(b,d)
2500 Employees or More					
Establishments	1	3	3	2(b)	1
Employees	D	9,729	12,400	NA	(c)

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.
(b) Includes only metal cutting to avoid disclosure.
(c) The number of employees is included in the "1000-2499 Employees" category.
(d) Also includes data for the "2500 Employees or More" (metal cutting) category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

THE METAL CUTTING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1958	1963	1967	1972	1977
Number of Companies	611	784	865	NA	NA
Number of Establishments	627	801	903	894	917
Number of Employees	52,864	61,058	87,200	52,500	59,400
1 to 4 Employees					
Establishments	213	276	256	281	315
Employees	435	529	400	600	600
5 to 9 Employees					
Establishments	99	127	142	158	184
Employees	692	840	1,000	1,100	1,200
10 to 19 Employees					
Establishments	84	129	167	180	112
Employees	1,130	1,803	2,300	2,500	1,500
20 to 49 Employees					
Establishments	88	118	145	126	144
Employees	2,878	3,607	4,300	3,900	4,400
50 to 99 Employees					
Establishments	47	56	74	55	67
Employees	3,221	3,727	5,200	3,800	4,600
100 to 249 Employees					
Establishments	48	44	49	47	40
Employees	7,756	6,912	8,100	7,000	6,300
250 to 499 Employees					
Establishments	21	22	30	24	28
Employees	7,408	7,713	10,600	8,400	10,300
500 to 999 Employees					
Establishments	17	15	20	14	19
Employees	11,951	10,664	13,900	9,200	13,800
1000 to 2499 Employees					
Establishments	9	11	17	7	7
Employees	17,393(a)	15,534	28,900	16,200(a)	16,600(a)
2500 Employees or More					
Establishments	1	3	3	2	1
Employees	D(b)	9,729	12,400	D(b)	D(b)

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "2500 Employees or More" category.
(b) The number of employees is included in the "1000 to 2499 Employees" category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

THE METAL FORMING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1958	1963	1967	1972	1977
Number of Companies	279	362	344	NA	NA
Number of Establishments	291	366	350	383	426
Number of Employees	22,502	22,078	29,200	24,100	23,700
1 to 4 Employees					
Establishments	60	99	80	99	119
Employees	136	185	100	200	200
5 to 9 Employees					
Establishments	41	64	47	54	78
Employees	272	455	300	400	500
10 to 19 Employees					
Establishments	43	57	55	68	66
Employees	608	809	800	900	900
20 to 49 Employees					
Establishments	65	64	73	68	75
Employees	2,025	2,036	2,200	2,100	2,300
50 to 99 Employees					
Establishments	30	40	37	34	31
Employees	2,135	2,728	2,500	2,400	2,100
100 to 249 Employees					
Establishments	31	23	30	36	35
Employees	4,910	3,708	4,600	5,500	5,200
250 to 499 Employees					
Establishments	10	9	13	13	13
Employees	3,492	3,536	4,500	4,200	4,500
500 to 999 Employees					
Establishments	9	7	10	10	8
Employees	8,924(a)	4,919	7,500	8,400(a)	7,900(a)
1000 to 2499 Employees					
Establishments	2	3	5	1	1
Employees	D(b)	3,702	6,600	D(b)	D(b)
2500 Employees or More					
Establishments	—	—	—	NA	NA
Employees	—	—	—	NA	NA

D - Withheld to avoid disclosure. NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.

(b) The number of employees is included in the "500 to 999 Employees" category.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77-1-35C," and earlier issues. See chapter introduction.

INVENTORIES OF THE MACHINE TOOL INDUSTRY
End of Year, Selected Years, 1967 to Date
(Millions of Dollars)

	Total Machine Tool Industry	Metal Cutting SIC 3541	Metal Forming SIC 3542
TOTAL INVENTORIES			
1967	$ 743.1	$ 535.3	$207.8
1970	820.5	562.9	257.6
1971	726.0	492.8	233.2
1972	724.9	482.2	242.7
1973	885.7	591.9	293.8
1974	1,150.0	786.2	363.8
1975	1,100.4	737.9	362.5
1976	1,048.3	735.4	312.9
1977	1,238.0	878.4	359.6
1978	1,434.0	1,012.3	421.7
1979	1,689.2	1,242.2	447.0
1980	1,874.6	1,419.4	455.2
1981(p)	1,965.2	1,485.5	479.7
Finished Products			
1967	158.9	112.1	46.8
1970	197.7	135.5	62.2
1971	186.1	123.2	62.9
1972	173.6	112.8	60.7
1973	174.7	111.0	63.7
1974	223.8	148.3	75.5
1975	244.6	166.0	78.6
1976	233.5	168.9	64.6
1977	264.7	184.2	80.5
1978	282.4	199.7	82.7
1979	312.1	222.3	89.8
1980	354.1	253.5	100.6
1981(p)	453.9	315.9	138.0
Work in Process			
1967	442.0	329.5	112.5
1970	458.1	326.4	131.7
1971	385.5	278.3	107.2
1972	395.2	279.8	115.4
1973	521.2	371.4	149.8
1974	678.2	492.6	185.6
1975	618.1	447.7	170.4
1976	596.3	443.8	152.5
1977	717.6	537.5	180.1
1978	868.5	642.3	226.2
1979	1,042.8	812.5	230.3
1980	1,220.3	989.4	230.9
1981(p)	1,210.0	989.1	220.9
Materials, Supplies, Fuel, Etc.			
1967	142.2	93.7	48.5
1970	164.7	101.0	63.7
1971	154.4	91.3	63.1
1972	156.2	89.6	66.5
1973	189.8	109.5	80.3
1974	248.0	145.3	102.7
1975	237.7	124.2	113.5
1976	218.4	122.7	95.7
1977	255.7	156.7	99.1
1978	283.1	170.3	112.8
1979	334.3	207.4	126.9
1980	300.0	176.4	123.6
1981(p)	301.3	180.5	120.8

p - Preliminary.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1977 Industry Series: Metalworking Machinery and Equipment, MC77(1)-35C" and earlier issues; U.S. Bureau of the Census, "Annual Survey of Manufactures." See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
Quantity Used

Material	Unit of Measure	Metal Cutting Industry 1967	Metal Cutting Industry 1972	Metal Cutting Industry 1977	Metal Forming Industry 1967	Metal Forming Industry 1972	Metal Forming Industry 1977
MILL SHAPES							
Carbon Steel	Short Ton	116,700(j)	85,900(i)	NA	184,500(e)	139,100(j)	113,400(a)
Stainless Steel	Short Ton	2,300	900	NA	600	500	100(m)
Other Alloy Steel	Short Ton	29,800	24,500	20,000(o)	15,100	9,600	12,000(n)
Copper and Alloy	000 Lbs.	2,000(d)	600(h,k)	3,800(d,h)	900(f)	300(k)	800(k)
Aluminum and Alloy	000 Lbs.	1,900	1,400(b)	NA	400(g)	NA	1,100
Iron and Steel Scrap	Short Ton	32,200	20,100	6,500	20,500	D	NA
CASTINGS (Rough and Semifinished)							
Iron (Gray & Malleable)	Short Ton	160,200	69,900	77,900(p)	43,500	36,500	NA
Steel		13,100	NA	NA	23,900	11,100	12,400(p)
Aluminum and Alloy	000 Lbs.	NA	NA	NA	1,000	700	2,600(p)
Copper and Alloy	000 Lbs.	1,600	1,100	1,700(p)	2,100	2,600	NA
IRON AND STEEL FORGINGS							
Iron & Steel Forgings	Short Ton	8,400	4,700	5,900(p)	10,100	7,500	8,200(p)
ELECTRIC MOTORS AND GENERATORS							
Fractional	Number	174,400	96,300(c)	1,900(l,p)	NA	900(1)	1,900(1,p)
Integral	Number	110,800	NA	NA	26,200	NA	NA

NA - Not Available. D - Withheld to avoid disclosure.

(a) Excludes structural shapes and all other carbon steel.
(b) Sheet and extrusion only.
(c) Excludes timing motors.
(d) Insulated wire and cable only.
(e) Excludes wire and wire products and sheet and strip.
(f) Excludes plate, sheet and strip and pipe and tube.
(g) Sheet and plate only.
(h) Bare wire only.
(i) Bars and bar shapes, sheet and strip, and plates only.
(j) Bars and bar shapes, sheet and strip, plates, and structural shapes only.
(k) Rod, bar, and mechanical wire and plate, sheet, and strip only.
(l) Timing motors only.
(m) Sheet and strip only.
(n) Excludes bars and bar shapes.
(o) Bars and bar shapes only.
(p) Purchased only.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977, 1972, 1967: Industry Series: Metalworking Machinery and Equipment." See chapter introduction.

PRODUCTS OF THE METAL CUTTING AND FORMING INDUSTRIES
Selected Years
(Values in Millions of Dollars)

Industry and Year					
Metal Cutting Industry (3541)	TOTAL SHIPMENTS	Metal Cutting Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1963	$1,060.8	$ 805.3	$187.9	$ 67.6	81%
1967	2,127.2	1,715.7	269.7	141.6	86
1972	1,418.1	1,135.5	188.9	93.7	86
1977	2,812.7	2,353.9	337.0	121.8	87
Metal Forming Industry (3542)	TOTAL SHIPMENTS	Metal Forming Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1963	$ 441.4	$ 350.9	$ 57.6	$ 32.9	86%
1967	714.0	568.4	99.5	46.1	85
1972	696.3	583.6	73.1	39.6	89
1977	1,130.6	967.1	111.6	51.9	90

Note: "Primary Product Specialization" is arrived at by dividing "Primary Products" by "Primary Products plus Secondary Products."

Source: U.S. Bureau of the Census, "Census of Manufactures, 1977; Industry Series: Metalworking Machinery and Equipment MC77-1-35C" and earlier issues. See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
(Millions of Dollars)

	Metal Cutting Industry			Metal Forming Industry		
Material	1967	1972	1977	1967	1972	1977
GRAND TOTAL	$657.3	$454.3	$904.4	$256.6	$253.4	$395.7
MILL SHAPES						
Carbon Steel	35.8	34.4	63.1	34.3	36.7	58.3
Stainless Steel	2.0	3.2	3.0	0.5	.6	.7
Other Alloy Steel	17.0	15.5	23.2	7.1	7.0	12.1
Copper and Alloy	3.8(a)	3.5	5.5	1.0	1.1(a)	2.4
Aluminum and Alloy	1.7	1.4	1.7	1.3	0.8	2.7
Iron and Steel Scrap	1.4	0.9	1.1	0.9	D	0.7
CASTINGS (Rough and Semifinished)						
Iron (Gray and Malleable)	76.6	43.6	84.5	18.7	18.1	29.4
Steel	10.3	4.4	8.7	12.9	8.9	18.8
Aluminum and Alloy	8.3	4.1	6.0	1.1	0.8	2.9
Copper and Alloy	1.8	1.2	2.5	2.2	2.9	1.5
IRON AND STEEL FORGING						
Iron and Steel Forgings	6.7	4.3	8.7	6.9	6.1	11.3
ELECTRICAL MOTORS AND GENERATORS						
Fractional	7.7	4.3	7.0	1.8	0.6	2.7
Integral	21.2	16.3	26.3	11.1	6.6	12.6
BEARINGS						
Ball and Roller	17.2	13.2	18.6	3.1	3.7	7.6
ALL OTHER MATERIALS						
Components, Parts, Etc.	347.2	227.0	478.6	117.9	114.7	151.7
NO BREAKDOWN FURNISHED						
Materials, Parts, Containers and Supplies	97.7	77.0	165.9	35.2	44.8	80.3

NA - Not Available. D - Withheld to avoid disclosure.

(a) Excludes bare wire, pipe and tube.

Source: U.S. Bureau of the Census "Census of Manufactures, 1977, 1972, 1967: Industry Series: Metalworking Machinery and Equipment," and earlier issues. See chapter introduction.

4

U. S. MACHINE TOOL SHIPMENTS AND ORDERS

This chapter deals with machine tool products shipped by the machine tool industry and other industries.

Up and Down Performance

The machine tool business is highly cyclical, a fact evidenced by historical patterns of new orders, shipments and order backlogs. The dramatic ups and downs in the value of shipments and orders tend to obscure significant changes in the "product mix"; the share of the total comprised by the different major machine tool product categories.

In complete metal cutting machine tools, for instance, shipments of milling machines dropped from 14.9% of the total shipments for 1969 to about seven-tenths as much in 1982 at 10.4%. Lathes and milling machines experienced declining relative portions of the market in 1982 while boring, drilling, and grinding and polishing machines all registered slight gains in relative shipment values. "Other" metal cutting machines have grown steadily as a share of total metal cutting, from 26.4% in 1969 to 42.9% in 1982. This group, which includes transfer and multi-function NC machines, has made up more than one-third of the total value of shipments since 1974.

Data Sources

Census and Annual Survey of Manufactures

The broadest coverage of machine tool shipment data is provided by the Census of Manufactures and the Annual Surveys of Manufactures. Included in these reports are statistics for: most of the major categories of metal cutting machine tools (boring, drilling, gear cutting, presses, etc.), machine tools primarily designed for home workshops and laboratories, parts sold separately, and machine tools originating primarily from small-sized plants-not specified by kind. Broad coverage is given to both metal cutting and metal forming machine tools in these reports.

The comprehensive Census of Manufactures is taken every five years (those ending in 2 and 7) and the Annual Survey of Manufactures is published in non-Census years. The charts and tables in this chapter were updated with published revised reports from the 1977 Census of Manufactures and the 1981 Annual Survey of Manufactures.

There are two other sources of machine tool shipment data widely used by students of the industry. One is the monthly order and shipment series published by NMTBA. The other is the quarterly "Current Industrial Report, Metalworking Machinery" (MQ35W), published by the U.S. Department of Commerce. The MQ-35W provides more detailed coverage of shipments by product types than either the Census or Survey of Manufactures. Both the MQ-35W and the NMTBA estimates are more timely and are published more frequently than either the Census or Annual Survey.

NMTBA Estimate of Orders and Shipments

The NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" is published monthly, normally three or four weeks after the end of the month reported. This report differs from the broader Census report in that it is limited to complete machine tools and excludes the value of: (a) machine tools costing under $2,500, (b) machine tools designed for home workshops, etc., (c) rebuilt machines and (d) parts sold separately.

Machine tool manufacturers representing more than two-thirds of total U.S. machine tool shipments participate in the NMTBA survey. The figures received each month from respondents are expanded, based on "benchmark" totals derived from the MQ-35W reports, to an estimate of the industry total by NMTBA's Statistical Department.

The MQ-35W Report

The "Current Industrial Report, Metalworking Machinery" (MQ-35W) is published quarterly, usually about three months after the end of the quarter reported, by the Bureau of the Census.

The report covers the number and value of total machine tools shipped, by 5- and 7-digit SIC categories, for more than 120 different machine tool products. It does not report new orders but does report unfilled orders.

The report is limited to information on complete new machine tools, excluding data for small machine tools designed for home use, etc., and data for rebuilt machines. It lists separately machines with a value of $2,500 and over, and those with a value under $2,500. The MQ-35W figures, excluding machine tools with an average value under $2,500, form the benchmark used for the NMTBA "Industry Estimate."

The MQ-35W report also includes data on numerically controlled machine tools and on manufacturers' exports. It is intended to cover all manufacturers of machine tool products, including those who produce machine tools for their own use but not for sale in the marketplace, and thus to cover all shipments.

SHIPMENTS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

Year	TOTAL			Metal Cutting			Metal Forming		
	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,377	$1,270	$107	$ 945	$ 858	$ 87	$ 432	$412	$ 20
1957	1,243	1,110	133	900	803	97	343	307	36
1958	591	507	84	438	381	57	153	126	27
1959	616	538	78	441	390	51	175	148	27
1960	744	580	164	541	420	121	203	160	43
1961	751	[illegible]	229	541	366	175	210	156	54
1962	821	606	215	613	450	163	208	156	52
1963	896	741	155	639	526	113	257	215	42
1964	1,164	959	205	845	679	166	319	280	39
1965	1,426	1,249	177	1,023	886	137	403	363	40
1966	1,685	1,535	150	1,222	1,098	124	463	437	26
1967	1,806	1,618	188	1,353	1,211	142	453	407	46
1968	1,727	1,563	164	1,358	1,238	120	369	325	44
1969	1,597	1,446	151	1,192	1,077	115	405	369	36
1970	1,443	1,239	204	993	827	166	450	412	38
1971	998	840	158	672	554	118	326	286	40
1972	1,019	894	124	714	627	87	304	267	37
1973	1,501	1,323	178	1,074	935	139	427	388	39
1974	2,031	1,763	267	1,445	1,241	205	585	522	63
1975	2,452	2,033	419	1,879	1,548	331	573	484	89
1976	2,060	1,744	316	1,482	1,270	212	578	474	104
1977	2,281	2,030	251	1,651	1,470	181	630	560	70
1978	3,013	2,689	325	2,189	1,960	228	825	729	96
1979	3,877	3,465	411	2,930	2,605	325	947	860	87
1980	4,692	4,084	608	3,681	3,206	475	1,011	878	133
1981	5,096	4,377	719	4,105	3,553	552	991	824	167
1982	3,604	3,198	406	2,895	2,599	296	710	600	110

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date
(Millions of Dollars)

Year	TOTAL			Metal Cutting			Metal Forming		
	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,298	$1,172	$126	$ 983	$ 882	$101	$ 315	$290	$ 25
1957	722	644	78	552	491	61	170	153	17
1958	427	350	77	299	247	52	128	103	25
1959	748	644	104	541	471	70	207	173	34
1960	744	527	217	535	375	160	209	152	57
1961	772	536	236	591	401	190	181	135	46
1962	815	661	154	571	468	103	244	193	51
1963	1,061	869	192	760	607	153	301	262	39
1964	1,577	1,348	229	1,038	861	177	539	487	52
1965	1,692	1,532	160	1,251	1,122	129	441	410	31
1966	2,074	1,884	190	1,629	1,483	146	445	401	44
1967	1,420	1,272	148	1,134	1,024	110	286	248	38
1968	1,474	1,320	154	1,080	960	120	394	360	34
1969	1,728	1,517	211	1,195	1,033	162	533	484	49
1970	912	733	179	651	507	144	261	226	35
1971	861	747	114	609	524	85	252	223	29
1972	1,412	1,245	167	1,009	877	132	403	368	35
1973	2,613	2,268	345	1,825	1,550	275	787	717	70
1974	2,583	2,185	398	2,017	1,716	301	566	470	96
1975	1,277	1,064	213	916	781	135	361	284	77
1976	2,203	1,961	242	1,662	1,477	185	541	485	56
1977	2,995	2,709	286	2,202	1,981	221	793	729	64
1978	4,349	3,944	405	3,375	3,043	332	973	901	72
1979	5,621	4,856	765	4,495	3,866	629	1,126	991	135
1980	4,754	4,239	515	3,885	3,496	369	870	744	126
1981	2,945	2,563	382	2,228	1,946	282	717	617	100
1982	1,498	1,261	236	1,064	890	175	433	372	62

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1957 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1957	$ 799	$ 77	$ 722	$ 618	$ 66	$ 552	$ 181	$ 11	$ 170
1958	451	24	427	317	18	299	134	6	128
1959	769	21	748	559	18	541	210	3	207
1960	790	46	744	571	36	535	219	10	209
1961	808	36	772	621	30	591	187	6	181
1962	852	37	815	603	32	571	249	5	244
1963	1,099	38	1,061	790	30	760	309	8	301
1964	1,652	75	1,577	1,084	46	1,038	568	29	539
1965	1,771	79	1,692	1,312	61	1,251	459	18	441
1966	2,217	143	2,074	1,737	108	1,629	480	35	445
1967	1,614	194	1,420	1,292	158	1,134	322	36	286
1968	1,631	157	1.474	1,216	136	1,080	415	21	394
1969	1,910	182	1,728	1.332	137	1,195	578	45	533
1970	1,060	148	912	757	106	651	303	42	261
1971	933	72	861	655	46	609	278	25	252
1972	1,465	53	1,412	1,051	42	1,009	414	11	403
1973	2,773	160	2,613	1,958	132	1,825	815	28	787
1974	2,970	387	2,583	2,283	266	2,017	687	121	566
1975	1,651	374	1,277	1,198	282	916	453	92	361
1976	2,370	167	2,203	1,793	131	1,662	578	37	541
1977	3,153	158	2,995	2,329	127	2,202	824	31	793
1978	4,573	224	4,349	3.559	184	3,375	1,013	40	973
1979	6,063	442	5,621	4,873	378	4,495	1,190	64	1,126
1980	5,381	627	4,754	4,436	551	3,885	946	76	870
1981	3,585	640	2,945	2,799	571	2,228	786	69	717
1982	1,934	437	1,498	1,467	402	1,064	468	34	433

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

UNFILLED ORDERS

Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

As of December 31	Total	Metal Cutting	Metal Forming	As of December 31	Total	Metal Cutting	Metal Forming
1956	$ 990	$ 735	$255	1970	$ 706	$ 471	$235
1957	471	388	83	1971	569	408	162
1958	308	249	59	1972	963	702	261
1959	443	350	93	1973	2,074	1,454	621
1960	444	344	100	1974	2,625	2,025	600
1961	467	394	73	1975	1,450	1,062	388
1962	463	354	109	1976	1,594	1,243	351
1963	628	475	153	1977	2,308	1,794	515
1964	1,043	669	374	1978	3,643	2,981	663
1965	1,311	899	412	1979	5,388	4,546	843
1966	1,701	1,307	394	1980	5,451	4,750	701
1967	1,317	1,089	228	1981	3,300	2,873	427
1968	1,064	810	295	1982	1,194	1,043	151
1969	1,195	812	424				

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL CUTTING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1956	$1,052	$ 69	$ 983	$ 946	$ 64	$ 882	$106	$ 5	$101
1957	618	66	552	555	64	491	63	2	61
1958	317	18	299	265	18	247	52	0	52
1959	559	18	541	486	15	471	73	3	70
1960	571	36	535	408	33	375	163	3	160
1961	621	30	591	425	24	401	196	6	190
1962	603	32	571	494	26	468	109	6	103
1963	790	30	760	632	25	607	158	5	153
1964	1,084	46	1,038	896	35	861	188	11	177
1965	1,312	61	1,251	1,175	53	1,122	137	8	129
1966	1,737	108	1,629	1,580	97	1,483	157	11	146
1967	1,292	158	1,134	1,173	149	1,024	119	9	110
1968	1,216	136	1,080	1,091	131	960	125	5	120
1969	1,332	137	1,195	1,160	127	1,033	172	10	162
1970	757	106	651	605	99	506	152	7	145
1971	655	46	609	565	41	524	90	5	85
1972	1,051	42	1,009	916	39	877	135	3	132
1973	1,953	132	1,825	1,675	124	1,550	283	8	275
1974	2,283	266	2,017	1,959	243	1,716	324	23	301
1975	1,198	282	916	1,027	247	780	171	35	136
1976	1,793	131	1,662	1,594	117	1,477	199	14	185
1977	2,329	127	2,202	2,095	114	1,981	234	13	221
1978	3,559	184	3,375	3,203	160	3,043	356	24	332
1979	4,873	378	4,495	4,202	337	3,866	671	42	629
1980	4,436	551	3,885	3,986	490	3,496	450	61	389
1981	2,799	571	2,228	2,476	530	1,946	323	41	282
1982	1,467	402	1,064	1,262	373	890	204	30	175

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL FORMING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

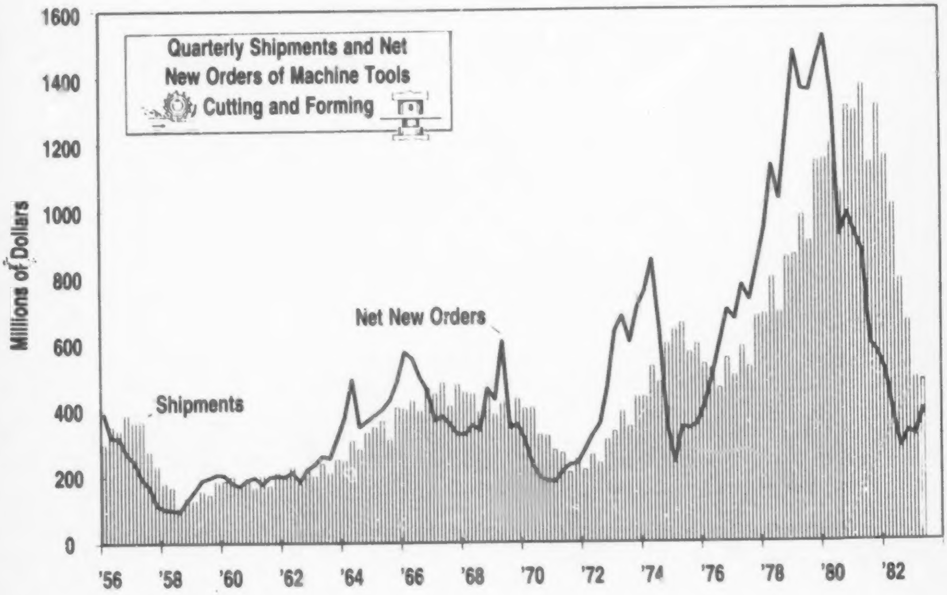
	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$ 340	$ 25	$ 315	$ 314	$ 24	$290	$ 26	$ 1	$ 25
1957	181	11	170	164	11	153	17	0	17
1958	134	6	128	108	5	103	26	1	25
1959	210	3	207	175	2	173	35	1	34
1960	219	10	209	161	9	152	58	1	57
1961	187	6	181	139	4	135	48	2	46
1962	249	5	244	197	4	193	52	1	51
1963	309	8	301	269	7	262	40	1	39
1964	568	29	539	511	24	487	57	5	52
1965	459	18	441	427	17	410	32	1	31
1966	480	35	445	434	33	401	46	2	44
1967	322	36	286	281	33	248	41	3	38
1968	415	21	394	380	20	360	35	1	34
1969	578	45	533	527	43	484	51	2	49
1970	303	42	261	265	38	227	38	4	34
1971	276	25	252	244	21	223	34	4	29
1972	414	11	403	378	10	368	36	1	35
1973	815	28	787	742	25	717	73	3	70
1974	687	121	566	583	113	470	105	8	96
1975	453	92	361	364	81	284	89	12	77
1976	578	37	541	513	28	485	64	8	56
1977	824	31	793	757	29	729	67	2	64
1978	1,013	40	973	938	37	901	75	3	72
1979	1,190	64	1,126	1,048	57	991	142	7	136
1980	946	76	870	814	70	744	132	6	126
1981	786	69	717	680	63	617	106	6	100
1982	468	34	433	399	28	372	68	7	62

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

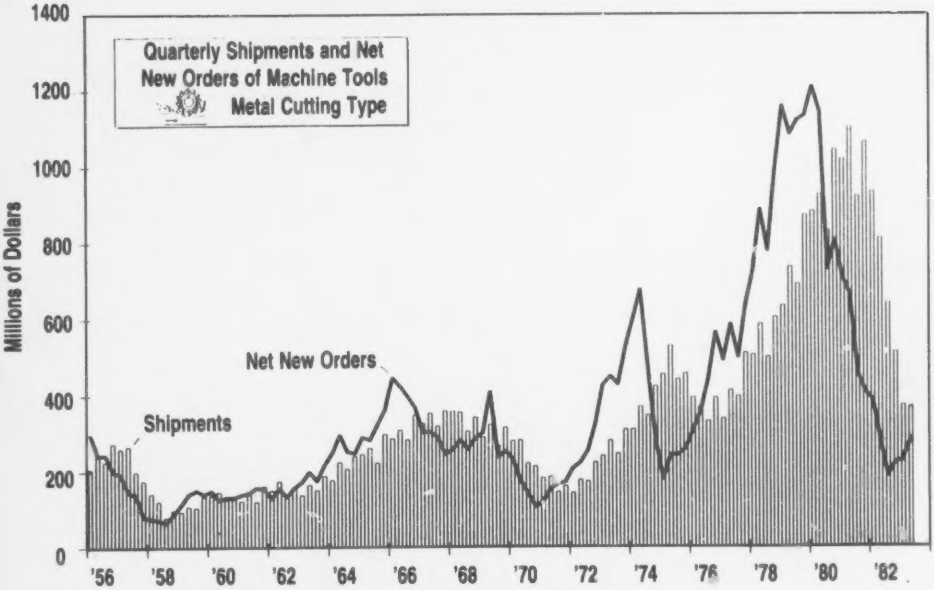
Total Machine Tool Shipments (Bar) and Net New Orders (Line)

Quarterly, 1956:1 to 1983:2



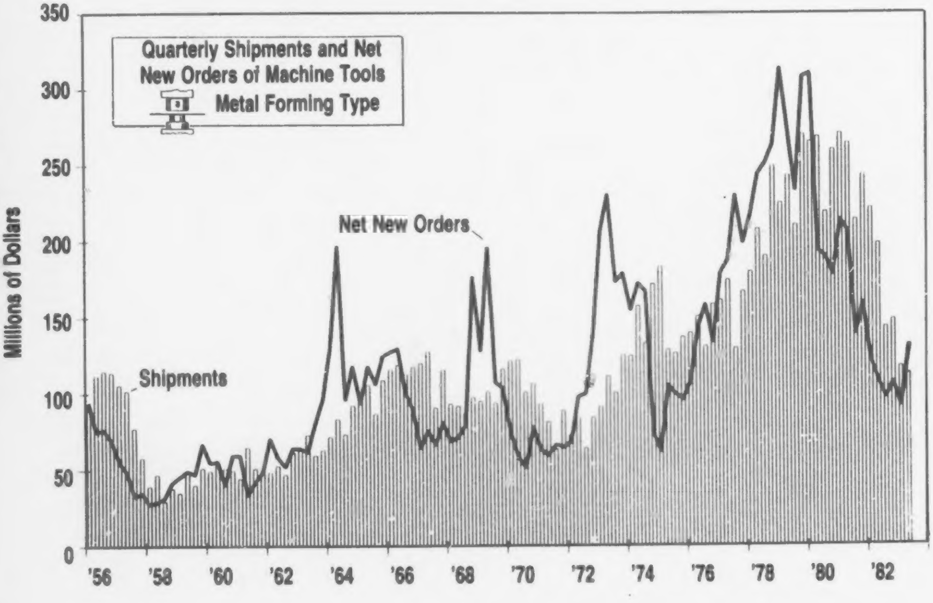
Metal Cutting Machine Tool Shipments (Bar) and Net New Orders (Line)

Quarterly, 1956:1 to 1983:2



Metal Forming Machine Tool Shipments (Bar) and Net New Orders (Line)

Quarterly, 1956:1 to 1983:2



SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956—1 qtr.	$ 274,100	$ 23,750	$187,700	$ 18,550	$ 86,400	$ 5,200
2	326,100	25,600	218,700	21,150	107,400	4,450
3	319,200	21,100	208,100	17,350	111,100	3,750
4	350,900	36,550	243,700	29,950	107,200	6,600
Total	$1,270,300	$107,000	$858,200	$ 87,000	$412,100	$20,000
1957—1 qtr.	$ 331,900	$ 33,350	$232,950	$ 26,650	$ 98,950	$ 6,700
2	325,700	41,900	236,150	29,650	89,550	12,250
3	248,050	28,350	179,300	19,800	68,750	8,550
4	204,700	28,750	155,150	20,500	49,550	8,250
Total	$1,110,350	$132,350	$803,550	$ 96,600	$306,800	$35,750
1958—1 qtr.	$ 160,050	$ 19,900	$125,500	$ 15,400	$ 34,550	$ 4,500
2	141,800	25,700	105,050	15,750	36,750	9,950
3	90,300	17,450	65,400	13,050	24,900	4,400
4	115,000	21,000	85,150	13,100	29,850	7,900
Total	$ 507,150	$ 84,050	$381,100	$ 57,300	$126,050	$26,750
1959—1 qtr.	$ 108,200	$ 20,750	$ 9,300	$ 14,900	$ 28,900	$ 5,850
2	137,450	19,550	95,450	12,050	42,000	7,500
3	130,650	14,400	95,050	10,000	35,600	4,400
4	162,000	23,000	120,050	13,800	41,950	9,200
Total	$ 538,300	$ 77,700	$389,850	$ 50,750	$148,450	$26,950
1960—1 qtr.	$ 159,550	$ 25,950	$117,700	$ 18,700	$ 41,850	$ 7,250
2	160,400	38,500	116,950	28,750	43,450	9,750
3	136,950	38,650	96,350	28,450	40,600	10,200
4	123,950	60,050	89,750	44,850	34,200	15,200
Total	$ 580,850	$163,150	$420,750	$120,750	$160,100	$42,400
1961—1 qtr.	$ 116,150	$ 50,100	$ 83,650	$ 38,550	$ 32,500	$11,550
2	146,450	56,650	95,900	42,550	50,550	14,100
3	117,200	53,750	80,250	39,800	36,950	13,950
4	142,850	67,750	106,750	53,800	36,100	13,950
Total	$ 522,650	$228,250	$366,550	$174,700	$156,100	$53,550
1962—1 qtr.	$ 140,250	$ 57,700	$106,100	$ 43,900	$ 34,150	$13,800
2	159,750	66,950	121,150	53,050	38,600	13,900
3	136,200	41,250	98,400	32,400	37,800	8,850
4	169,850	49,300	124,400	33,450	45,450	15,850
Total	$ 606,050	$215,200	$450,050	$162,800	$156,000	$52,400

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1963-1969

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963—1 qtr.	$ 163,100	$ 36,850	$ 112,600	$ 24,650	$ 50,500	$12,200
2	203,300	33,500	140,550	23,600	62,750	9,900
3	173,000	36,150	122,450	27,450	50,550	8,700
4	201,850	48,000	150,450	36,700	51,400	11,300
Total	$ 741,250	$154,500	$ 526,050	$112,400	$215,200	$42,100
1964—1 qtr.	$ 197,250	$ 50,700	$ 135,900	$ 40,550	$ 61,350	$10,150
2	259,800	46,700	183,550	39,850	76,250	6,850
3	231,200	47,950	170,400	35,700	60,800	12,250
4	271,500	59,250	189,300	49,400	82,200	9,850
Total	$ 959,750	$204,600	$ 679,150	$165,500	$280,600	$39,100
1965—1 qtr.	$ 304,100	$ 42,600	$ 209,850	$ 34,150	$ 94,250	$ 8,450
2	319,850	45,700	225,200	35,100	94,650	10,600
3	271,300	36,700	193,700	27,850	77,600	8,850
4	353,550	51,800	257,100	39,600	96,450	12,200
Total	$1,248,800	$176,800	$ 885,850	$136,700	$362,950	$40,100
1966—1 qtr.	$ 361,650	$ 39,000	$ 253,900	$ 31,350	$107,750	$ 7,650
2	389,700	36,150	277,200	30,150	112,500	6,000
3	361,950	32,300	256,800	25,150	105,150	7,150
4	421,050	43,400	309,600	37,600	111,450	5,800
Total	$1,534,350	$150,850	$1,097,500	$124,250	$436,850	$26,600
1967—1 qtr.	$ 399,500	$ 41,050	$ 289,750	$ 35,900	$109,750	$10,000
2	428,850	50,750	315,450	36,250	113,400	14,050
3	367,350	45,900	287,200	30,800	80,150	10,250
4	422,250	50,300	318,650	39,200	103,600	11,550
Total	$1,617,950	$188,000	$1,211,050	$142,150	$406,900	$45,850
1968–1 qtr.	$ 402,200	$ 48,250	$ 321,500	$ 36,000	$ 80,700	$12,250
2	392,800	53,550	313,850	40,950	78,950	12,600
3	361,750	29,550	282,900	21,650	78,850	7,900
4	406,000	32,800	320,050	21,400	85,950	11,400
Total	$1,562,750	$164,150	$1,238,300	$120,000	$324,450	$44,150
1969—1 qtr.	$ 353,500	$ 30,600	$ 268,100	$ 21,350	$ 85,400	$ 9,250
2	384,300	38,450	293,250	28,500	91,050	9,950
3	321,950	37,800	234,850	31,450	87,100	6,350
4	387,000	43,950	281,250	33,700	105,750	10,250
Total	$1,446,750	$150,800	$1,077,450	$115,000	$369,300	$35,800

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1970-1976

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970—1 qtr.	$ 351,950	$ 48,700	$ 241,500	$ 37,900	$110,450	$ 10,800
2	348,000	54,800	236,200	44,550	111,800	10,250
3	269,350	51,600	176,050	44,350	93,300	7,250
4	269,650	49,000	173,600	38,750	96,050	10,250
Total	$1,238,950	$204,100	$ 827,350	$165,550	$411,600	$ 38,550
1971—1 qtr.	$ 228,500	$ 46,300	$ 142,900	$ 39,000	$ 85,600	$ 7,300
2	228,350	37,900	154,200	30,850	74,150	7,050
3	173,000	35,100	120,300	24,800	52,700	10,300
4	209,950	38,800	136,800	23,450	73,150	15,350
Total	$ 839,800	$158,100	$ 554,200	$118,100	$285,600	$ 40,000
1972—1 qtr.	$ 183,750	$ 31,550	$ 121,900	$ 20,850	$ 61,850	$ 10,700
2	229,550	31,050	155,650	21,100	73,900	9,950
3	209,300	27,050	151,300	21,200	58,000	5,850
4	271,750	34,700	198,300	24,150	73,450	10,550
Total	$ 894,350	$124,350	$ 627,150	$ 87,300	$267,200	$ 37,050
1973—1 qtr.	$ 295,050	$ 35,500	$ 209,950	$ 29,400	$ 85,100	$ 6,100
2	347,500	43,200	243,750	36,050	103,750	7,150
3	296,650	48,950	207,450	37,850	89,200	11,100
4	383,900	50,250	273,900	35,400	110,000	14,850
Total	$1,323,100	$177,900	$ 935,050	$138,700	$388,050	$ 39,200
1974—1 qtr.	$ 378,550	$ 54,750	$ 269,850	$ 39,400	$108,700	$ 15,350
2	464,250	61,350	323,800	44,850	140,450	16,500
3	408,800	69,350	291,000	54,700	117,800	14,650
4	511,550	81,950	356,700	65,550	154,850	16,400
Total	$1,763,150	$267,400	$1,241,350	$204,500	$521,800	$ 62,900
1975—1 qtr.	$ 526,550	$109,700	$ 375,400	$ 78,400	$151,150	$ 31,300
2	554,750	101,400	443,450	84,550	111,300	16,850
3	467,150	99,650	361,850	79,050	105,300	20,600
4	484,150	108,350	367,400	88,550	116,750	19,800
Total	$2,032,600	$419,100	$1,548,100	$330,550	$484,500	$ 88,550
1976—1 qtr.	$ 446,550	$ 85,300	$ 334,150	$ 53,500	$112,400	$ 26,800
2	425,400	92,450	302,100	65,750	123,300	26,700
3	393,450	66,900	284,850	45,100	108,600	21,800
4	477,950	71,650	348,750	42,900	129,200	28,750
Total	$1,743,350	$316,300	$1,269,850	$212,250	$473,500	$104,050

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1977 to Date
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977—1 qtr.	$ 433,800	$ 63,100	$ 297,550	$ 38,550	$136,250	$ 24,550
2	526,300	58,400	365,650	45,150	160,650	13,250
3	476,000	48,050	359,300	35,850	116,700	12,200
4	594,100	81,000	447,350	61,400	146,750	19,600
Total	$2,030,200	$250,550	$1,469,850	$180,950	$560,350	$ 69,600
1978—1 qtr.	$ 620,900	$ 62,300	$ 459,650	$ 44,200	$161,250	$ 18,100
2	712,550	79,050	526,950	57,250	185,600	21,800
3	609,800	77,750	438,850	59,200	170,950	18,550
4	745,350	105,750	534,650	67,750	210,700	38,000
Total	$2,688,600	$324,850	$1,960,100	$228,400	$728,500	$ 96,450
1979—1 qtr.	$ 769,750	$ 88,300	$ 564,450	$ 69,000	$205,300	$ 19,300
2	869,050	109,150	648,100	87,650	220,950	21,500
3	802,800	97,050	611,350	78,500	191,450	18,550
4	1,023,700	116,750	781,600	89,400	242,100	27,350
Total	$3,465,300	$411,250	$2,605,500	$324,550	$859,800	$ 86,700
1980—1 qtr.	$1,030,450	$115,700	$ 794,650	$ 86,750	$235,800	$ 28,950
2	1,037,750	155,550	802,500	122,850	235,250	32,700
3	915,200	133,850	727,800	102,650	187,400	31,200
4	1,100,850	202,400	881,050	162,550	219,800	39,850
Total	$4,084,250	$607,500	$3,206,000	$474,800	$878,250	$132,700
1981—1 qtr.	$1,077,400	$210,800	$ 862,250	$155,600	$215,150	$ 55,200
2	1,131,150	236,350	917,950	185,450	213,200	50,900
3	1,006,000	127,950	820,350	99,950	185,650	28,000
4	1,162,100	143,850	951,900	111,050	210,200	32,800
Total	$4,376,650	$718,950	$3,552,450	$552,050	$824,200	$166,900
1982—1 qtr.	$1,041,550	$112,650	$ 861,300	$ 71,750	$180,250	$ 40,900
2	911,850	96,600	735,300	75,350	176,550	21,250
3	676,200	107,200	550,700	89,750	125,500	17,450
4	568,750	89,600	451,300	59,300	117,450	30,300
Total	$3,198,350	$406,050	$2,598,600	$296,150	$599,750	$109,900

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipment and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956—1 qtr.	$ 353,700	$ 39,050	$265,200	$ 33,200	$ 88,500	$ 5,850
2	291,700	26,300	222,550	20,300	69,150	6,000
3	284,150	34,800	215,400	27,150	68,750	7,650
4	242,700	26,450	179,050	20,650	63,650	5,800
Total	$1,172,250	$126,600	$882,200	$101,300	$290,050	$25,300
1957—1 qtr.	$ 221,300	$ 25,500	$168,850	$ 22,950	$ 52,450	$ 2,550
2	176,600	16,300	131,650	12,900	44,950	3,400
3	152,450	17,300	123,450	13,700	29,000	3,600
4	95,150	19,150	68,000	11,650	27,150	7,500
Total	$ 645,500	$ 78,250	$491,950	$ 61,200	$153,550	$17,050
1958—1 qtr.	$ 86,000	$ 17,600	$ 61,750	$ 14,400	$ 24,250	$ 3,200
2	78,300	22,650	57,050	15,150	21,250	7,500
3	79,800	15,950	55,450	8,700	24,350	7,250
4	107,200	21,250	73,700	13,300	33,500	7,950
Total	$ 351,300	$ 77,450	$247,950	$ 51,550	$103,350	$25,900
1959—1 qtr.	$ 139,100	$ 18,300	$ 97,900	$ 14,150	$ 41,200	$ 4,150
2	172,700	16,800	127,550	12,800	45,150	4,000
3	168,300	28,500	132,350	17,450	35,950	11,050
4	164,350	42,200	113,150	26,450	51,200	15,750
Total	$ 644,450	$105,800	$470,950	$ 70,850	$173,500	$34,950
1960—1 qtr.	$ 158,500	$ 44,750	$112,850	$ 35,700	$ 45,650	$ 9,050
2	124,250	55,900	85,600	39,100	38,650	16,800
3	114,950	56,550	90,200	41,150	24,750	15,400
4	129,950	60,100	86,350	44,350	43,600	15,750
Total	$ 527,650	$217,300	$375,000	$160,300	$152,650	$57,000
1961—1 qtr.	$ 140,550	$ 57,000	$ 95,150	$ 43,250	$ 45,400	$13,750
2	124,150	53,000	100,050	43,750	24,100	9,250
3	128,100	70,250	97,450	59,050	30,650	11,200
4	143,950	57,550	108,500	44,600	35,450	12,950
Total	$ 536,750	$237,800	$401,150	$190,650	$135,600	$47,150
1962—1 qtr.	$ 156,600	$ 42,300	$102,200	$ 26,200	$ 54,400	$16,100
2	167,400	45,300	123,850	30,850	43,550	14,450
3	147,950	36,400	108,850	23,550	39,100	12,850
4	190,100	30,550	133,950	22,650	56,150	7,900
Total	$ 662,050	$154,550	$468,850	$103,250	$193,200	$51,300

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1963-1969
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963—1 qtr.	$ 196,150	$ 39,000	$ 140,250	$ 31,100	$ 55,900	$ 7,900
2	197,300	62,150	148,300	49,450	49,000	12,700
3	208,750	45,700	140,350	33,850	68,400	11,850
4	267,450	45,100	177,950	38,500	89,500	6,600
Total	$ 869,650	$191,950	$ 606,850	$152,900	$262,800	$39,050
1964—1 qtr.	$ 312,150	$ 64,000	$ 194,200	$ 52,900	$117,950	$11,100
2	428,100	63,200	248,150	46,300	179,950	16,900
3	293,750	52,850	209,900	40,700	83,850	12,150
4	314,050	50,800	209,000	38,000	105,050	12,800
Total	$1,348,050	$230,850	$ 861,250	$177,900	$486,800	$52,950
1965—1 qtr.	$ 338,850	$ 43,150	$ 253,000	$ 35,500	$ 85,850	$ 7,650
2	365,650	33,400	255,400	26,050	110,250	7,350
3	385,050	42,800	284,500	37,250	100,550	5,550
4	443,400	41,100	329,750	30,250	113,650	10,850
Total	$1,532,950	$160,450	$1,122,650	$129,050	$410,300	$31,400
1966—1 qtr.	$ 514,200	$ 57,450	$ 398,150	$ 46,450	$116,050	$11,000
2	497,800	54,350	384,400	38,500	113,400	15,850
3	457,650	38,100	364,950	30,550	92,700	7,550
4	414,800	41,300	335,600	31,300	79,200	10,000
Total	$1,884,450	$191,200	$1,483,100	$146,800	$401,350	$44,400
1967—1 qtr.	$ 327,800	$ 37,150	$ 268,600	$ 32,350	$ 59,200	$ 4,800
2	335,600	42,500	273,550	29,100	62,050	13,400
3	319,200	35,350	262,950	25,350	56,250	10,000
4	290,200	33,800	219,550	23,500	70,650	10,300
Total	$1,272,800	$148,800	$1,024,650	$110,300	$248,150	$38,500
1968—1 qtr.	$ 287,050	$ 36,800	$ 223,700	$ 31,750	$ 63,350	$ 5,050
2	307,300	44,850	246,400	34,750	60,900	10,100
3	303,800	31,900	232,200	24,250	71,600	7,650
4	422,300	40,100	257,600	28,700	164,700	11,400
Total	$1,320,450	$153,650	$ 959,900	$119,450	$360,550	$34,200
1969—1 qtr.	$ 376,550	$ 51,450	$ 260,000	$ 40,250	$116,550	$11,200
2	557,850	46,000	372,550	35,700	185,300	10,300
3	279,300	63,700	184,950	51,100	94,350	12,600
4	303,300	50,600	215,150	35,600	88,150	15,000
Total	$1,517,000	$211,750	$1,032,650	$162,650	$484,350	$49,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970—1 qtr.	$ 256,650	$ 48,750	$ 191,300	$ 39,750	$ 65,350	$ 9,000
2	185,550	46,100	131,950	41,850	53,600	4,250
3	150,400	41,750	106,900	34,150	43,500	7,600
4	140,750	42,600	76,600	28,800	64,150	13,800
Total	$ 733,350	$179,200	$ 506,750	$144,550	$226,600	$34,650
1971—1 qtr.	$ 151,000	$ 30,550	$ 95,500	$ 23,250	$ 55,500	$ 7,300
2	182,250	30,150	128,800	24,550	53,450	5,600
3	204,100	27,450	144,500	20,900	59,600	6,550
4	209,950	25,700	155,300	15,950	54,650	9,750
Total	$ 747,300	$113,850	$ 524,100	$ 84,650	$223,200	$29,200
1972—1 qtr.	$ 242,050	$ 33,550	$ 180,550	$ 27,100	$ 61,500	$ 6,450
2	284,750	34,900	193,800	28,350	90,950	6,550
3	301,550	51,550	210,900	42,800	90,650	8,750
4	417,100	46,550	292,000	33,450	125,100	13,100
Total	$1,245,450	$166,550	$ 877,250	$131,700	$368,200	$34,850
1973—1 qtr.	$ 558,150	$ 73,850	$ 370,150	$ 55,850	$188,000	$18,000
2	610,550	67,550	395,450	52,550	215,100	15,000
3	512,850	87,250	358,450	68,900	154,400	18,350
4	586,050	116,400	426,350	97,750	159,700	18,650
Total	$2,267,600	$345,050	$1,550,400	$275,050	$717,200	$70,000
1974—1 qtr.	$ 644,500	$107,700	$ 509,750	$ 88,100	$134,750	$19,600
2	737,950	109,900	592,550	83,650	145,400	26,250
3	536,300	95,200	394,100	70,900	142,200	24,300
4	266,500	85,000	219,250	58,750	47,250	26,250
Total	$2,185,250	$397,800	$1,715,650	$301,400	$469,600	$96,400
1975—1 qtr.	$ 188,350	$ 49,250	$ 147,700	$ 28,550	$ 40,650	$20,700
2	276,800	68,950	201,050	39,800	75,750	29,150
3	293,750	46,700	209,600	31,750	84,150	14,950
4	305,150	47,800	222,150	35,300	83,000	12,500
Total	$1,064,050	$212,700	$ 780,500	$135,400	$283,550	$77,300
1976—1 qtr.	$ 354,500	$ 58,800	$ 259,950	$ 45,800	$ 94,550	$13,000
2	452,700	43,900	322,700	31,350	130,000	12,550
3	527,800	69,500	383,500	55,900	144,300	13,600
4	626,450	69,550	510,450	52,500	116,000	17,050
Total	$1,961,450	$241,750	$1,476,600	$185,550	$484,850	$56,200

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1977 to Date
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977—1 qtr.	$ 603,900	$ 63,550	$ 443,850	$ 45,150	$160,050	$ 18,400
2	692,250	78,300	522,600	61,100	169,650	17,200
3	650,700	75,150	435,300	60,900	215,400	14,250
4	762,800	68,700	578,950	54,200	183,850	14,500
Total	$2,709,650	$285,700	$1,980,700	$221,350	$728,950	$ 64,350
1978—1 qtr.	$ 847,300	$ 92,750	$ 646,250	$ 77,600	$201,050	$ 15,150
2	1,013,250	116,700	789,550	97,000	223,700	19,700
3	953,850	73,800	720,700	56,250	233,150	17,550
4	1,129,700	121,150	886,650	101,450	243,050	19,700
Total	$3,944,100	$404,400	$3,043,150	$332,300	$900,950	$ 72,100
1979—1 qtr.	$1,322,800	$148,600	$1,031,550	$126,700	$291,250	$ 21,900
2	1,189,000	167,450	963,300	120,250	225,700	47,200
3	1,171,850	181,350	969,400	151,100	202,450	30,250
4	1,172,850	267,550	901,550	231,250	271,300	36,300
Total	$4,856,500	$764,950	$3,865,800	$629,300	$990,700	$135,650
1980—1 qtr.	$1,331,950	$185,500	$1,057,900	$149,900	$274,050	$ 35,600
2	1,210,050	125,300	1,054,300	87,800	155,750	37,500
3	825,350	92,150	659,050	69,250	166,300	22,900
4	872,200	111,800	724,250	82,300	147,950	29,500
Total	$4,239,550	$514,750	$3,495,500	$389,250	$744,050	$125,500
1981—1 qtr.	$ 809,950	$110,400	$ 615,250	$ 91,350	$194,700	$ 19,050
2	723,600	143,400	559,950	101,250	163,650	42,150
3	530,650	62,800	408,100	47,150	122,550	15,650
4	498,450	65,600	362,500	42,550	135,950	[illegible],050
Total	$2,562,650	$382,200	$1,945,800	$282,300	$616,850	$ 99,900
1982—1 qtr.	$ 432,300	$ 74,500	$ 328,400	$ 56,450	$103,900	$ 18,050
2	303,050	79,600	216,450	58,300	86,600	21,300
3	237,300	42,650	154,000	29,450	83,300	13,200
4	288,700	39,650	190,750	30,650	97,950	9,000
Total	$1,261,350	$236,400	$ 889,600	$174,850	$371,750	$ 61,550

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOL PRODUCTS
By Type of Machine, 1974 to Date
(Millions of Dollars)

	1974	1975	1976	1977	1978	1979	1980	1981
MACHINE TOOLS TOTAL	$3,189.4	$3,431.8	$3,197.4	$3,675.2	$4,735.0	$5,762.3	$6,701.5	$7,206.1
METAL CUTTING TOTAL	2,136.1	2,405.7	2,146.4	2,560.5	3,377.1	4,127.5	4,952.3	5,554.0
Boring Machines	85.3	90.6	80.2	93.5	133.0	169.9	200.0	227.0
Drilling Machines	81.1	97.9	(99.0)	108.9	(155.0)	167.1	188.8	155.0
Gear Cutting & Finishing Machines	70.2	71.7	61.9	67.1	111.5	104.6	124.7	132.5
Grinding & Polishing Machines (a)	269.8	276.2	243.5	288.3	359.5	464.5	553.8	623.3
Lathes	396.1	474.0	449.8	455.9	554.9	675.7	823.0	865.3
Milling Machines	143.3	141.9	146.8	167.8	204.8	259.3	(322.0)	390.4
Other Machine Tools (b)	631.1	802.3	629.8	713.6	994.8	1,279.3	1,620.8	1,838.3
Parts (c)	396.5	382.8	400.7	502.1	606.0	813.7	877.3	1,038.2
Not Specified by Kind	(62.7)	(68.4)	(34.7)	163.3	(s)	(193.3)	(241.8)	(284.0)
METAL FORMING TOTAL	1,053.3	1,026.1	1,051.0	1,114.7	1,357.9	1,634.8	1,749.2	1,652.1
Punching, Shearing, Bending & Forming	211.4	242.3	271.3	280.1	320.4	389.9	429.0	444.1
Presses (d)	327.2	282.8	268.1	282.6	369.1	449.5	498.5	422.7
Other (b)	192.4	162.3	157.0	171.7	220.3	264.4	238.9	221.4
Parts (c)	304.0	322.8	344.3	295.5	400.5	482.5	530.8	498.4
Not Specified by Kind	(18.3)	(15.9)	(10.2)	84.8	(s)	48.5	52.0	65.5

(a) Excluding Gear-Tooth Grinding, Honing, Lapping, Polishing and Buffing Machines.
(b) Including those designed primarily for Home Workshops, Laboratories, etc.
(c) Parts sold separately and rebuilt machine tools.
(d) Including Forging Presses.
(s) Withheld because estimate did not meet publication standards.
( ) Indicates standard errors exceeding 15%.

Sources: U.S. Bureau of the Census; "Census of Manufactures, Metal Working Machinery and Equipment" and "Annual Survey of Manufactures".

This table includes machine tool products only—those produced as "primary" products of the machine tool industry and as "secondary" products by other industries.

SHIPMENTS OF MACHINE TOOLS

Metal Cutting and Metal Forming, Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 671,907	NA	NA	NA	NA
1959	196,701	679,538	65,892	$ 648,368	130,809	$ 31,170
1960	183,142	777,692	62,225	749,900	120,917	27,792
1961	170,98[illegible]	764,453	57,503	737,051	113,479	27,402
1962	190,288	867,269	67,678	837,370	122,610	29,899
1963	198,571	967,133	73,255	934,485	125,316	32,648
1964	212,257	1,209,076	81,020	1,176,645	131,237	32,431
1965	250,492	1,457,685	93,350	1,418,294	157,142	39,391
1966	321,705	1,712,849	112,654	1,658,651	209,051	54,198
1967	311,472	1,869,298	117,651	1,820,197	193,821	49,101
1968	301,114	1,722,727	95,927	1,668,852	205,187	53,875
1969	308,273	1,692,188	92,148	1,631,239	216,125	60,949
1970	252,431	1,551,777	73,517	1,501,454	178,914	50,323
1971	211,432	1,057,870	51,843	1,009,389	159,589	48,481
1972	267,065	1,269,302	71,655	1,220,521	195,410	48,781
1973	307,680	1,787,850	94,833	1,724,719	212,847	63,131
1974	337,799	2,165,937	106,016	2,096,198	231,783	69,739
1975	280,341	2,406,082	92,731	2,353,936	187,610	52,146
1976	270,875	2,178,265	82,937	2,119,846	187,938	58,419
1977	284,583	2,453,423	92,270	2,393,964	192,313	59,459
1978	327,460	3,142,594	87,589	3,050,209	239,871	92,385
1979	345,218	4,064,045	89,586E	3,934,566E	255,632E	129,479E
1980	323,899	4,812,349	88,428E	4,674,068E	235,471E	138,281E
1981(r)	301,313	5,111,253	87,981E	5,007,848E	213,332E	103,405E
1982(p)	187,402	3,744,305	57,211E	3,674,300E	130,191E	70,005E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Data on shipments of complete machine tools published in the "Current Industrial Reports" series of the Census tend to vary slightly from those published by NMTBA. There are several reasons for the difference; among them is the fact that NMTBA reports are extended to a 100 percent estimate based on earlier coverage by the "Current Industrial Reports" series. Refer to this chapter's introduction for a detailed explanation of the various sources of statistics for machine tools.

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date
(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 462,934	NA	NA	NA	NA
1959	143,380	468,777	45,212	$ 447,009	98,168	$ 21,768
1960	133,511	539,340	42,914	520,294	90,597	19,046
1961	124,260	531,343	40,363	512,424	83,897	18,919
1962	138,855	626,833	47,942	606,297	90,913	20,536
1963	139,896	657,607	50,353	635,157	89,543	22,450
1964	153,831	874,467	58,714	852,392	95,117	22,075
1965	184,168	1,047,823	68,005	1,021,331	116,163	26,492
1966	242,698	1,231,907	80,673	1,194,149	162,025	37,758
1967	236,167	1,373,178	86,014	1,336,419	150,153	36,759
1968	225,778	1,309,361	70,505	1,271,876	155,273	37,485
1969	229,974	1,242,550	65,199	1,198,504	164,775	44,046
1970	188,491	1,097,718	49,314	1,061,066	139,177	36,652
1971	157,099	714,454	32,443	677,841	124,656	36,613
1972	207,290	857,964	47,846	821,899	159,444	36,065
1973	252,237	1,224,715	63,685	1,175,058	188,552	49,657
1974	272,811	1,525,575	69,060	1,466,671	203,751	58,904
1975	229,169	1,790,360	65,883	1,750,797	163,286	39,563
1976	212,757	1,592,216	54,974	1,546,631	157,783	45,585
1977	220,017	1,791,293	59,500	1,743,724	160,517	47,569
1978	257,647	2,334,425	58,116	2,265,541	199,531	68,884
1979	263,019	3,037,205	59,453E	2,943,225E	203,566E	93,980E
1980	248,563	3,716,370	62,185E	3,612,645E	186,378E	103,725E
1981(r)	234,647	4,046,940	66,076E	3,978,970E	168,571E	67,970E
1982(p)	141,571	2,918,780	40,485E	2,872,476E	101,086E	46,304E

p - Preliminary. r - Revised. NA - Not available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 203,973	NA	NA	NA	NA
1959	53,321	210,761	20,680	$ 201,359	32,641	$ 9,402
1960	49,631	238,352	19,311	229,606	30,320	8,746
1961	46,722	233,110	17,140	224,627	29,582	8,483
1962	51,433	240,436	19,736	231,073	31,697	9,363
1963	58,675	309,526	22,902	299,328	35,773	10,198
1964	58,426	334,609	22,306	324,253	36,120	10,356
1965	66,324	409,862	25,345	396,963	40,979	12,899
1966	79,007	480,942	31,981	464,502	47,026	16,440
1967	75,305	496,120	31,637	483,778	43,668	12,342
1968	75,336	413,366	25,422	396,976	49,914	16,390
1969	78,299	449,638	26,949	432,735	51,350	16,903
1970	63,940	454,059	24,203	440,388	39,737	13,671
1971	54,333	343,416	19,400	331,548	34,933	11,868
1972	59,775	411,338	24,107	398,622	35,668	12,716
1973	55,443	563,135	31,148	549,661	24,295	13,474
1974	64,988	640,362	36,956	629,527	28,032	10,835
1975	51,172	615,722	26,848	603,139	24,324	12,583
1976	58,118	586,049	27,963	573,215	30,155	12,834
1977	64,566	662,130	32,770	650,240	31,796	11,890
1978	69,813	808,169	29,473	784,668	40,340	23,501
1979	82,199	1,026,840	30,133	991,341	52,066	35,499
1980	75,336	1,095,979	26,243	1,061,423	49,093	34,556
1981(r)	66,666	1,064,313	21,905	1,028,878	44,761	35,435
1982(p)	45,831	825,525	16,726	801,824	29,105	23,701

p - Preliminary. r - Revised. NA - Not Available.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series, MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1954 to Date

(Millions of Dollars)

Year	TOTAL	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting Machines
1954	$ 879.0	$114.4	$ 86.1	$ 48.1	$154.3	$206.9	$122.5	$ 146.7
1955	665.8	77.4	53.8	36.6	123.9	153.3	89.6	131.2
1956	891.8	101.8	65.4	49.4	172.8	217.1	115.8	169.5
1957	878.3	102.0	56.3	38.9	160.1	199.8	155.0	166.2
1958	463.0	51.6	30.0	22.7	89.4	98.7	89.3	81.3
1959	468.8	46.2	33.4	24.7	93.8	119.5	73.3	77.9
1960	539.3	46.9	38.9	34.3	117.0	135.4	79.4	87.4
1961	531.3	51.5	36.8	36.4	121.0	126.5	73.7	85.4
1962	626.8	61.4	53.2	35.8	127.9	152.3	95.8	100.4
1963	657.6	67.9	52.0	39.5	136.8	154.8	106.1	100.5
1964	874.5	74.1	72.3	47.1	175.9	198.1	125.8	181.2
1965	1,047.8	91.9	83.2	55.7	213.6	234.8	144.0	224.7
1966	1,231.9	110.9	105.9	59.0	235.9	286.5	201.7	232.0
1967	1,373.2	117.8	122.8	63.9	247.8	334.0	234.3	252.6
1968	1,309.4	93.7	67.7	68.2	235.1	316.2	234.1	294.4
1969	1,242.6	80.2	67.5	65.6	227.3	288.9	184.6	328.5
1970	1,097.7	62.1	70.9	66.3	219.4	240.1	110.0	329.0
1971	714.5	35.8	43.4	50.1	142.9	174.9	54.4	212.7
1972	858.0	54.1	65.8	50.3	151.0	203.2	81.7	251.9
1973	1,224.7	66.7	90.5	55.4	209.6	299.0	104.6	398.9
1974	1,525.6	81.4	77.9	66.2	249.9	370.2	137.7	542.3
1975	1,790.4	83.9	92.9	65.1	273.2	464.2	134.0	677.1
1976	1,592.2	77.8	100.4	56.0	246.8	430.3	134.4	546.6
1977	1,791.3	84.9	107.2	61.4	273.1	436.3	160.2	668.1
1978	2,334.4	117.7	152.4	102.7	348.6	535.9	194.3	882.9
1979	3,037.2	177.4	150.5	111.2	474.9	650.3	279.8	1,193.1
1980(r)	3,716.4	192.0	166.9	130.3	555.8	827.0	339.3	1,505.2
1981(r)	4,046.9	231.0	140.0	133.1	615.4	816.8	436.6	1,674.2
1982(p)	2,918.8	193.8	105.6	86.5	460.1	517.6	303.4	1,251.7

p - Preliminary. r - Revised.

Note: Other Metal Cutting Machines include machining centers, transfer machines, shapers, sawing and cutoff machines, and other metal cutting machines not classified elsewhere. For a breakdown by type, refer to pages detailing shipments of these machines also appearing in this chapter.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
By Class of Product, 1954 to Date
(Percentage of Dollar Value)

Year	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting & Finishing	35414 Grinding & Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting
1954	13.0%	9.8%	5.5%	17.6%	23.5%	13.9%	16.7%
1955	11.6	8.1	5.5	18.6	23.0	13.5	19.7
1956	11.4	7.3	5.5	19.4	24.3	13.0	19.0
1957	11.6	6.4	4.4	18.2	22.7	17.6	18.9
1958	11.1	6.5	4.9	19.3	21.3	19.3	17.6
1959	9.9	7.1	5.3	20.0	25.5	15.6	16.6
1960	8.7	7.2	6.4	21.7	25.1	14.7	16.2
1961	9.7	6.9	6.9	22.8	23.8	13.9	16.1
1962	9.8	8.5	5.7	20.4	24.3	15.3	16.0
1963	10.3	7.9	6.0	20.8	23.5	16.1	15.3
1964	8.5	8.3	5.4	20.1	22.7	14.4	20.7
1965	8.8	7.9	5.3	20.4	22.4	13.7	21.4
1966	9.0	8.6	4.8	19.1	23.3	16.4	18.8
1967	8.6	8.9	4.7	18.0	24.3	17.1	18.4
1968	7.2	5.2	5.2	18.0	24.1	17.9	22.5
1969	6.5	5.4	5.3	18.3	23.2	14.9	26.4
1970	5.7	6.5	6.0	20.0	21.9	10.0	30.0
1971	5.0	6.1	7.0	20.0	24.5	7.6	29.8
1972	6.3	7.7	5.9	17.6	23.7	9.5	29.4
1973	5.4	7.4	4.5	17.1	24.4	8.5	32.6
1974	5.3	5.1	4.3	16.4	24.3	9.0	35.6
1975	4.7	5.2	3.6	15.3	25.9	7.5	37.8
1976	4.9	6.3	3.5	15.5	27.0	8.4	34.3
1977	4.7	6.0	3.4	15.2	24.4	8.9	37.3
1978	5.0	6.5	4.4	14.9	23.0	8.3	37.9
1979	5.8	5.0	3.7	15.6	21.4	9.2	39.3
1980(r)	5.2	4.5	3.5	15.0	22.3	9.1	40.5
1981(r)	5.7	3.5	3.3	15.2	20.2	10.8	41.4
1982(p)	6.6	3.6	3.0	15.8	17.7	10.4	42.9

p - Preliminary. r - Revised.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Report, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1954 to Date
(Millions of Dollars)

Year	TOTAL (a)	35422 Presses, Including Forging (b)	35423 (In Part) Forging, Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1954	$ 350.2	$216.4	$24.4	$ 26.3	$ 35.6	$ 47.5
1955	295.4	170.8	15.6	28.9	35.8	44.3
1956	384.1	240.1	15.5	34.9	48.8	44.8
1957	403.2	238.7	24.7	38.3	43.9	57.6
1958	209.0	76.5	17.4	32.0	32.1	51.0
1959	210.8	84.6	17.9	29.9	35.7	42.7
1960	238.4	105.0	21.0	32.9	34.3	45.2
1961	233.1	111.3	15.8	33.3	32.5	40.2
1962	240.4	109.5	23.7	34.5	29.0	43.7
1963	309.5	136.0	22.3	42.8	45.2	63.2
1964	334.6	169.5	23.1	33.2	42.7	66.1
1965	409.9	209.2	32.8	43.9	49.4	74.6
1966	480.9	253.3	32.7	49.7	51.0	94.2
1967	496.1	240.1	29.6	56.9	57.4	112.1
1968	413.4	199.1	31.9	57.1	64.4	60.9
1969	449.6	223.7	32.0	53.6	66.0	74.3
1970	454.1	239.6	36.6	47.7	59.8	70.4
1971	343.4	166.5	37.0	41.4	53.3	45.2
1972	411.3	166.7	34.5	62.5	67.9	79.8
1973	563.1	242.7	38.7	75.8	94.5	111.4
1974	640.4	307.0	40.1	86.1	113.0	94.2
1975	615.7	269.4	39.5	121.0	115.4	70.4
1976	586.0	223.6	52.2	120.0	118.8	71.4
1977	662.1	260.7	55.1	130.6	137.2	78.5
1978	808.2	350.9	59.3	146.6	147.7	103.7
1979	1,026.8	434.0	84.7	181.2	183.4	143.5
1980	1,096.0	440.8	73.8	204.2	214.9	162.3
1981(r)	1,064.3	429.6	79.0	206.1	212.8	136.8
1982(p)	825.5	338.9	77.2	137.8	157.5	114.1

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1954 to Date

(Percentage of Dollar Value)

Year	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines Excluding Presses (c)	35421 (In Part) Punching & Shearing Machines	35421 (In Part) Bending & Forming Machines	35423 (In Part) 35435 (In Part) Other (a)
1954	61.8%	7.0%	7.5%	10.2%	13.5%
1955	57.8	5.3	9.8	12.1	15.0
1956	62.5	4.0	9.1	12.7	11.7
1957	59.2	6.1	9.5	10.9	14.3
1958	36.6	8.3	15.3	15.4	24.4
1959	40.1	8.5	14.2	16.9	20.3
1960	44.0	8.8	13.8	14.4	19.0
1961	47.7	6.8	14.3	13.9	17.3
1962	45.5	9.9	14.3	12.1	18.2
1963	44.0	7.2	13.8	14.6	20.4
1964	50.7	6.9	9.9	12.8	19.7
1965	51.0	8.0	10.7	12.1	18.2
1966	52.7	6.8	10.3	10.6	19.6
1967	48.4	5.9	11.5	11.6	22.6
1968	48.2	7.7	13.8	15.6	14.7
1969	49.8	7.1	11.9	14.7	16.5
1970	52.7	8.1	10.5	13.2	15.5
1971	48.5	10.8	12.0	15.5	13.2
1972	40.5	8.4	15.2	16.5	19.4
1973	43.1	6.9	13.4	16.8	19.8
1974	47.9	6.3	13.4	17.7	14.7
1975	43.8	6.4	19.7	18.7	11.4
1976	38.2	8.9	20.5	20.3	12.2
1977	39.4	8.3	19.7	20.7	11.9
1978	43.4	7.3	18.1	18.3	12.9
1979	42.3	8.2	17.6	17.9	14.0
1980	40.2	6.7	18.6	19.6	14.8
1981(r)	40.4	7.4	19.4	20.0	12.9
1982(p)	41.1	9.4	16.7	19.1	13.8

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
TOTAL						
	1970(a)	1,901	$ 209.0	1982(p,g)	6,378	$1,148.0
	1971(a)	1,238	153.2			
	1972(a)	1,630	170.1			
	1973(a)	2,865	272.1			
	1974(a)	4,210	378.7			
	1975(a)	4,136	504.7			
	1976(a)	3,856	501.0			
	1977(a)	4,482	496.7			
	1978(a)	5,688	649.2			
	1979(g)	7,925	1,014.6			
	1980(r,g)	9,984	1,371.7			
	1981(r,g)	8,945	1,467.3			
Boring Machines						
	1970	175	29.5	1982(p)	231	110.7
	1971	92	18.4			
	1972	84	21.0			
	1973	128	26.8			
	1974	146	33.7			
	1975	153	39.4			
	1976	120	35.6			
	1977	101	33.0			
	1978	127	47.3			
	1979	186	69.6			
	1980	226	92.5			
	1981	293	120.2			
Drilling Machines						
	1970	215	13.0	1982(p)	449	66.9
	1971	138	11.3			
	1972	118	8.4			
	1973	326	19.0			
	1974	216	11.7			
	1975	100	11.0			
	1976	197	13.2			
	1977	288	20.0			
	1978	321	22.0			
	1979	237	17.7			
	1980	384	33.4			
	1981	455	52.8			
Lathes						
	1970	507	55.3	1982(p)	1,489	325.3
	1971	428	50.4			
	1972	570	67.1			
	1973	1,031(c)	95.2(c)			
	1974	1,381	137.3			
	1975	1,640	212.7			
	1976	1,321	205.9			
	1977	1,178	195.3			
	1978	1,464	237.2			
	1979	2,362	347.7			
	1980	2,739	481.2			
	1981	2,021	441.4			

(Continued)

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
Milling Machines (d)						
	1970	150	$ 23.4	1982(p)	1,037	$177.2
	1971	105	12.6			
	1972	229	15.8			
	1973	240	16.1			
	1979	2,045	93.8			
	1980	2,600	162.7			
	1981	1,763	190.6			
Machining Centers						
	1970	651	68.9	1982(p)	1,265	339.6
	1971	344	46.6			
	1972	475	45.3			
	1973	1,162	115.1			
	1974	1,692	163.1			
	1975	1,460	196.8			
	1976	1,225	178.4			
	1977	1,201	175.0			
	1978	1,486	246.0			
	1979	1,953	356.5			
	1980	2,132	413.0			
	1981	2,081	482.7			
Grinding and Polishing Machines						
	1979	206	28.6	1982(p)	495	42.4
	1980	271	32.9			
	1981	645	46.7			
All Other Metal Cutting and Metal Forming Type Machine Tools						
	1970	203	19.0	1982(p)	1,412(g)	86.1(g)
	1971	131	13.9			
	1972	154	12.6			
	1973	17(a,e)	5.0(a,e)			
	1974	775(a,f)	32.8(a,f)			
	1975	783(a,f)	44.8(a,f)			
	1976	993(a,f)	67.9(a,f)			
	1977	1,714(a,f)	73.4(a,f)			
	1978	2,290(a,f)	96.7(a,f)			
	1979	936(g)	100.7(g)			
	1980(r)	1,632(g)	156.0(g)			
	1981(r)	1,687(g)	133.0(g)			

p - Preliminary. r - Revised.

(a) No metal forming NC data are included.
(b) Beginning with 1973, data no longer published.
(c) Includes data for grinding and polishing machines.
(d) For 1974-1978 data were included in the "All Other" category.
(e) For 1973 only, grinding and polishing machines are reported with lathes and are not included in the "All Other" category.
(f) Includes milling machines and grinding and polishing machines.
(g) Includes data for punching, shearing, bending, and forming machines; all other metal forming NC data withheld to avoid disclosure.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

NUMERICALLY CONTROLLED AND AUTOMATIC METALWORKING MACHINERY
By Type of Control
Total Shipments and Unfilled Orders, 1964 to 1972 (a)

	SHIPMENTS			UNFILLED ORDERS December 31		
	Number of Machines	Millions of Dollars		Number of Machines	Millions of Dollars	
		Machines & Controls	Controls Only		Machines & Controls	Controls Only
TOTAL						
1964	1,517	$105.5	$29.2	987	$113.7	$26.4
1965	2,100	159.3	43.9	1,964	211.3	57.1
1966	2,939	249.1	55.5	2,439	329.3	75.7
1967	2,957	284.9	69.4	2,054	337.9	72.1
1968	2,917	353.8	81.2	1,336	253.8	53.3
1969	2,376	293.9	70.2	1,148	172.3	36.9
1970	1,901	209.0	50.1	683	121.8	26.3
1971	1,238	153.2	36.0	581	107.7	23.3
1972	1,630	170.1	42.3	1,334	182.1	50.6
Point-to-Point Positioning						
1964	1,145	52.4	15.0	586	43.9	12.2
1965	1,604	89.0	25.9	1,278	93.5	25.6
1966	2,044	126.4	26.1	1,422	139.0	33.4
1967	2,050	143.0	36.1	1,033	100.3	24.0
1968	1,752	141.6	34.8	530	67.3	16.4
1969	1,324	110.2	27.6	507	54.7	12.8
1970	1,033	82.3	19.2	222	38.3	7.7
1971	476	50.4	11.2	146	30.3	6.2
1972	605	49.5	10.4	337	50.8	15.7
Continuous Path Activated by Tape or Punch Card						
1964	172	36.7	11.2	151	35.0	10.7
1965	229	43.7	13.8	383	86.1	25.7
1966	524	79.5	22.9	637	151.4	33.8
1967	621	113.2	27.3	782	211.4	41.4
1968	991	198.2	43.2	700	176.6	34.5
1969	899	171.0	39.8	577	106.6	22.7
1970	785	118.9	29.5	423	78.4	17.9
1971	711	97.6	23.8	425	76.6	16.9
1972	989	117.4	31.3	977	128.3	34.4
Dial or Plug Board Type of Prerecorded Motion Program Control						
1964	200	16.4	3.0	250	34.8	3.5
1965	267	26.6	4.2	303	31.7	5.8
1966	371	43.2	6.5	380	38.9	8.5
1967	286	28.7	6.0	239	26.2	6.7
1968	174	14.0	3.2	106	9.9	2.4
1969	153	12.7	2.8	64	9.0	1.4
1970	83	7.9	1.4	38	5.1	0.7
1971	51	5.2	0.9	10	0.8	0.2
1972	36	3.3	0.6	20	3.0	0.4

(a) The publication of this data was discontinued in 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BORING MACHINES
Units and Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
TOTAL	767	662	761	922	1,671	1,793	1,699	994
Horizontal Boring, Drilling & Milling Machines								
Table Type	136	175	81	104	97	102	115	77
Floor Type			88	85	82	72	29	
Precision Boring Machines	631	487	509	648	868	771	661	564
Jig Boring Machines			83	85	624	848	894	353
All Other Boring Machines			—					
VALUE (Millions of Dollars)								
TOTAL	$83.9	$77.8	$84.9	$117.7	$177.7	$192.0	$231.0	$193.8
Horizontal Boring, Drilling and Milling Machines								
Table Type	32.1	40.6	23.3	35.6	38.1	41.4	53.0	51.4
Floor Type			15.4	15.3	21.4	23.8	15.5	
Precision Boring Machines	51.8	37.2	32.0	50.2	87.8	96.3	122.1	109.7
Jig Boring Machines			14.2	16.6	30.1	30.5	40.4	32.6
All Other Boring Machines			—					

p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GEAR CUTTING MACHINES
Units and Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980(r)	1981(r)	1982(p)
UNITS								
TOTAL	849	509	624	878	828	931	837	445
Gear Tooth Finishing Machines(a)	849	509	384	488	646	432	254	160
Gear Hobbers-Horizontal and Vertical (b)			240	390	182	499	583	285
All Other Gear Cutting Machines			0	0	(c)	(c)	(c)	(c)
VALUE (Millions of Dollars)								
TOTAL	$65.1	$56.0	$61.4	$102.7	$111.2	$130.3	$133.1	$86.5
Gear Tooth Finishing Machines (a)	65.1	56.0	42.8	66.2	91.3	69.0	55.3	39.9
Gear Hobbers-Horizontal and Vertical (b)			18.6	36.4	19.9	61.3	77.9	46.7
All Other Gear Cutting Machines			0	0	(c)	(c)	(c)	(c)

p - Preliminary.

(a) Includes level gear generators.

(b) Includes gear shapers.

(c) Included in gear tooth finishing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF DRILLING MACHINES
Units and Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980(r)	1981(r)	1982(p)
UNITS								
TOTAL	45,028	40,664	42,815	52,247	44,697	34,898	27,195	22,936
Average Value Under $1,000 (a)	39,729	36,154	36,971	49,412	41,476	31,474	24,129	20,878
Average Value $1,000 and Over (b)	5,299	4,510	5,844	2,835	3,221	3,424	3,066	2,058
Vertical Drilling Machines								
Plain Upright	1,063	929	1,530	438	1,339(e)	1,089(e)	892(e)	600(e)
Indexing Turret Head, Heavy Duty and Other	921	289(d)E	249(d)	277(d)				
Radial Drilling Machines								
Plain and Universal Under 13"	240	175	68	54	226	232	331	154
All Other	D	D	D	D				
Deep Hole Drilling Machines	(c)	(c)	(c)	(c)	184	190	154	112
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	763	502	301E	290	378	628	522	378
Automatic Drilling			D	598	797	(c)	(c)	(c)
All Other	D	112	105	D				
All Other Drilling Machines	1,840	1,835	2,202	256	297	1,285	1,167	814
VALUE (Millions of Dollars)								
TOTAL	$92.8	$100.4	$107.2	$152.4	$150.5	$166.9	$140.0	$105.6
Average Value Under $1,000 (a)	12.2	13.2	12.8	22.2	25.9	18.6	20.2	17.6
Average Value $1,000 & Over (b)	80.6	87.2	94.4	130.2	124.6	148.3	119.8	88.0
Vertical Drilling Machines								
Plain Upright	4.2	3.3	3.9	2.6	18.2(e)	22.7(e)	22.1(e)	16.0(e)
Indexing Turret Heard, Heavy Duty and Other	11.6	6.4(d)E	5.9(d)	7.5(d)				
Radial Drilling Machines								
Plain and Universal Under 13"	2.9	2.7	2.1	1.7	9.7	12.6	14.0	5.2
All Other	D	D	D	D				
Deep Hole Drilling Machines	(c)	(c)	(c)	(c)	5.8	10.6	15.7	10.5
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	29.7	43.9	13.5E	11.6	21.1	26.2	20.1	10.7
Automatic Drilling			D	67.0	57.0	(c)	(c)	(c)
All Other	D	11.5	6.4	D				
All Other Drilling Machines	15.6	8.7	11.2	9.5	18.6	76.2	47.8	45.6

p - Preliminary. r - Revised. D - Withheld to avoid disclosure. E - Estimate by NMTBA.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and over for 1978 to date.
(c) Included with "All Other Drilling Machines".
(d) Includes only heavy duty. Disclosure was reported for indexing turret head and other.
(e) Includes all vertical drilling machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units and Value, 1971 to 1978

Products	1971(c)	1972(c)	1973(c)	1974(c)	1975(c)	1976(c)	1977(c)	1978(c)
UNITS								
TOTAL	11,071	12,295	16,904	19,305	17,581	14,085	11,249	13,[illegible]7
Average Under $1,000	D	D	D	D	D	D	D	D(a)
Average $1,000 and Over	D	D	D	D	D	D	D	D(b)
Bench Lathes (Except Bench Turret Lathes)	D	D	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy),								
Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	4,317	4,383	6,611	3,929(f)	3,836(f)	2,869(f)	4,510	3,640
17" to 23" Swing	139	126	285	(g)	(g)	(g)	157E	141
24" Swing and Over	61	53	52	296	321	300	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	1,804	1,965
Turret Lathes								
Bench and Floor Light Duty Type	1,052(d)	665(d)						
Ram Type	100E		D	D	D	D	D	D
Automatic Chucking Lathes								
Single Spindle	351	547	828	896	1,050	637(h)E	790(h)	1,076(h)
Multiple Spindle	231	182	270	248	214	174	214	255
Automatic Between Center Lathes	88	107	217	236	179	99	141	179
Screw (bar) Machines	933	1,107	1,434	1,676	1,189	1,051(i)E	695(i)	782(i)
Vertical Turning and Boring Mills	87E	98E	108	153	183	171	121	129
All Other	631	465	1,893	505	448	701	712	846
VALUE (Millions of Dollars)								
TOTAL	$174.9	$203.2	$299.0	$370.2	$464.2	$430.3	$436.3	$535.9
Average Under $1,000	D	D	D	D	D	D	D	D(a)
Average $1,000 and Over	D	D	D	D	D	D	D	D(b)
Bench Lathes (Except Bench Turret Lathes)	D	D	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy),								
Floor Mounted								
Over Cross Slide	26.3	28.4	48.8	50.5(f)	55.9(f)	54.6(f)	53.4	64.0
17" to 23" Swing	6.3	4.0	10.4	(g)	(g)	(g)	11.1E	18.4
24" Swing and Over	6.5	6.5	3.8	20.7	31.8	30.6	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	18.7	23.1
Turret Lathes								
Bench and Floor Light Duty Type	15.1(d)	22.0(d)						
Ram Type	2.7E		D	D	D	D	D	D
Automatic Chucking Lathes								
Single Spindle	21.3	27.3	47.7	60.2	82.6	59.4(h)E	72.2(h)	100.9(h)
Multiple Spindle	20.9	17.0	30.1	27.6	32.3	30.6	37.9	50.2
Automatic Between Center Lathes	5.4	8.0	14.5	19.0	18.6	13.4	23.0	31.4
Screw (bar) Machines	36.3	42.8	56.9	70.1	73.7	52.9(i)E	61.4(i)	71.5(i)
Vertical Turning and Boring Mills	18.4E	20.7E	20.2	30.9	42.3	46.1	38.5	42.2
All Other	12.1	20.3	30.6	26.3	38.7	26.7	29.9	48.1

E - Estimate by NMTBA.   D - Withheld to avoid disclosure.

(a) Average Under $2,500.
(b) Average $2,500 and over.
(c) Data for specific machines limited to machines valued at $1,000 or over through 1977, $2,500 or over beginning in 1978.
(d) Includes saddle type.
(e) Included with "All Other".
(f) Excludes 8" and under.
(g) Included with 24" Swing and Over.
(h) Includes single spindle with index turret only. Disclosure was reported for single spindle without index turret.
(i) Includes multiple spindle only. Disclosure was reported for single spindle.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES

Units and Value, 1979 to Date

(Millions of Dollars)

Products	1979	1980	1981(r)	1982(p)
UNITS				
TOTAL	20,107	17,937	16,904	10,758
NUMERICALLY CONTROLLED				
AVERAGE OVER $2,500				
Turning Machines-Horizontal Spindle				
Small	1,293	1,532	977	775
Medium	766	768	541	308
Large	121	224	266	212
Turning Machines-Vertical Spindle	182	215	237	194
Turret Lathes & Boring Machines over 30"				
All Other				
NON-NUMERICALLY CONTROLLED				
AVERAGE UNDER $2,500	D	D	D	D
AVERAGE $2,500 and Over	D	D	D	D
Manufacturing and Tool Room Lathes, Engine and Tool Room (Light and Heavy)				
Floor Mounted				
Up to and Including 16" Swing Over Cross Slide	3,200	2,211	2,657	1,369
17" to 23" Swing	288	246	240	155
24" and Over				
All Other Engine and Tool Room Lathes				
Turret Lathes, Horizontal Type	916	1,063	D	D
Automatic Lathes-Single Spindle				
Bar (Screw) Machines	D	D	D	D
Chucking Machines	563	561	357	D
Automatic Lathes-Multiple Spindle				
Bar (Screw) Machines	759	848	809	293
Chucking Machines	146	176	131	54
Automatic Between Center Lathes	87	115	182	62
All Other Horizontal Turning Machines				
Vertical Turret Lathes and Boring Machines	246	D	D	D
All Other Vertical Turning Machines	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D
VALUE (Millions of Dollars)				
TOTAL	$650.3	$827.0	$816.8	$517.6
NUMERICALLY CONTROLLED				
AVERAGE OVER $2,500				
Turning Machines-Horizontal Spindle				
Small	107.9	167.0	134.2	87.9
Medium	147.0	168.5	128.7	74.8
Large	29.5	64.5	83.7	67.7
Turning Machines-Vertical Spindle	63.3	81.1	94.8	94.8
Turret Lathes & Boring Machines over 30"				
All Other				
NON-NUMERICALLY CONTROLLED				
AVERAGE UNDER $2,500	D	D	D	D
AVERAGE $2,500 and Over	D	D	D	D
Manufacturing and Tool Room Lathes, Engine and Tool Room (Light and Heavy)				
Floor Mounted				
Up to and Including 16" Swing Over Cross Slide	36.8	26.2	27.9	20.3
17" to 23" Swing	17.7	29.0	27.8	20.4
24" and Over				
All Other Engine and Tool Room Lathes				
Turret Lathes, Horizontal Type	15.0	17.3	D	D
Automatic Lathes-Single Spindle				
Bar (Screw) Machines	D	D	D	D
Chucking Machines	29.3	32.8	26.1	D
Automatic Lathes-Multiple Spindle				
Bar (Screw) Machines	80.5	89.9	99.6	40.7
Chucking Machines	25.2	33.5	30.9	14.1
Automatic Between Center Lathes	12.2	25.8	46.8	15.7
All Other Horizontal Turning Machines				
Vertical Turret Lathes and Boring Machines	9.7	D	D	D
All Other Vertical Turning Machines	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D

D - Withheld to avoid disclosure.   r - Revised.   p - Preliminary.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery".

SHIPMENTS OF GRINDING AND POLISHING MACHINES (h)
Units, 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
TOTAL	102,336	86,315	95,234	110,202	107,288	97,004	91,548	58,284
Average Value Under $1,000(a)	87,923	72,243	80,484	91,373	89,238	79,509	76,687	48,962
Average Value $1,000 and Over(b)	14,413	14,072	14,750	18,829	18,050	17,495	14,861	9,322
External Cylindrical Grinding Machines								
Plain	257	(e)	172	247	325	297	383	327
Universal	223	231	204	226	313	305	291	236
Roll and Centerless }	642	298	(e) }	546	821	935	880	538
All Other(c) }								
Internal Cylindrical Grinding Machines	(e) }	764	781	(e)	(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	440	283	271	289	397	348	264	152
Reciprocating Table Type								
Vertical and Horizontal	1,491(d)	1,523(d)	1,632(d)	1,921(d)	2,217	2,941	1,850	1,265
Hand Surface Type	1,722	1,836	2,581	2,839 }	3,147	3,523	1,822	1,165
Planer Type and All Other	(e)	(e)	(e)	(e) }		(e)	(e)	(e)
Bench, Floor and Snag Grinders	1,668	1,367	1,066	1,359	728	537	484	366
Tool and Cutter Grinding Machines								
Universal }	1,906	1,924	2,079	2,111	2,367	2,610	2,818	1,512
Special }								
Polishing and Buffing Machines								
Stand, drum & disc types	(e)	372E	372	849	543	326	309	(e)
All Other	397	647	1,102	2,011	2,083	1,581	1,501	608
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External }	2,145	3,059	2,445	1,667	2,154	1,871	1,486	997
All Other Honing and Lapping Machines }				362	535	370	354	(e)
All Other	3,522(f)	1,768E(g)	2,045(g)	4,402(g)	2,420(g)	1,851(g)	2,419(g)	2,156(g)

p - Preliminary. r - Revised. E - Estimated.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and Over for 1978 to date.
(c) Includes chucking grinders.
(d) Includes "Horizontal" only, disclosure was reported for "Vertical".
(e) Included in "All Other Grinding Machines".
(f) Includes internal cylindrical grinding, surface grinding-vertical reciprocating, planer type and all other, and floor polishing and buffing machines, and Other Grinding Machines, N.E.C. Includes thread grinding machines from 1974 to date.
(g) Includes surface grinding-vertical reciprocating, planer type and all other, and Other Grinding Machines, N.E.C.
(h) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (h)
Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980(r)	1981(r)	1982(p)
VALUE (Millions of Dollars)								
TOTAL	$273.2	$246.8	$273.1	$348.6	$474.9	$555.8	$615.4	$460.1
Average Value Under $1,000(a)	11.5	11.1	12.3	11.6	16.8	16.8	17.9	12.8
Average Value $ 1,000 and Over(b)	261.7	235.7	260.8	337.0	458.1	539.0	597.5	447.4
External Cylindrical Grinding Machines								
Plain	22.8	(e)	19.0	33.6	43.5	42.1	63.9	64.2
Universal	7.7	10.2	9.7	12.0	17.2	17.7	18.6	17.0
Roll and Centerless		31.0	(e)					
All Other(c)	60.3			64.4	107.5	132.0	160.8	92.6
Internal Cylindrical		46.7	50.6					
Grinding Machines	(e)			(e)	(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	19.4	11.5	14.5	21.2	35.3	36.7	36.5	21.4
Reciprocating Table Type								
Vertical and Horizontal	16.7(d)	18.5(d)	21.1(d)	27.4(d)	35.3	49.1	37.7	30.3
Hand Surface Type	6.6	8.3	11.6	13.3	16.8	21.6	13.8	9.2
Planer Type and All Other	(e)	(e)	(e)	(e)		(e)	(e)	(e)
Bench, Floor and Snag Grinders	14.3	12.0	12.6	16.9	7.5	6.2	7.3	3.2
Tool and Cutter Grinding Machines								
Universal Special	13.7	16.7	19.0	19.7	26.0	32.5	36.4	26.7
Polishing and Buffing Machines								
Stand, drum & disc types	(e)	8.8E	7.5	8.4	10.9	5.8	8.6	(e)
All Other	6.4	11.1	19.0	20.6	24.1	28.7	33.2	22.6
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	21.1	22.3	21.9	15.7	20.4	29.1	28.3	20.8
All Other Honing and Lapping Machines				9.4	10.7	11.7	13.9	(e)
All Other	72.7(f)	38.6E(g)	54.3(g)	74.4(g)	102.9(g)	125.8(g)	138.5(g)	139.4(g)

p - Preliminary. r - Revised. E - Estimated.

(a) Value under $2,500 for 1978 to date.

(b) Value $2,500 and Over for 1978 to date.

(c) Includes chucking grinders.

(d) Includes "Horizontal" only, disclosure was reported for "Vertical".

(e) Included in "All Other Grinding Machines".

(f) Includes internal cylindrical grinding, surface grinding-vertical reciprocating, planer type and all other, and floor type polishing and buffing machines, and Other Grinding Machines, N.E.C. Includes thread grinding machines from 1974 to date.

(g) Includes surface grinding-vertical reciprocating, planer type and all other, floor type polishing and buffing machines, and Other Grinding Machines, N.E.C.

(h) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Units, 1975 to Date

Products	1975	1976	1977	1978	1979	1980(r)	1981(r)	1982(p)
UNITS								
TOTAL	51,736	59,764	56,855	65,239	70,922	76,770	77,220	39,086
Average Value Under $1,000 (a)	29,475	44,997	41,163	53,432	59,852	64,819	64,347	29,990
Average Value $1,000 and Over (b)	22,261	14,767	15,118	11,807	11,070	11,951	12,873	9,096
Broaching Machines								
Hydraulic Mechanical and Other	193E	198	166	239	295	269	204	136
Planers, Shapers (Except Gear) and Slotters	77E		D	D	(c)	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	1,055	343E	747E	433	453	556	509	562
Circular Cutoff Saws	243	1,002	879	164	134	142	145	119
Abrasive Cutoff Saws	2,612			598	499	526	497	318
Band Saw	11,366	6,487	7,080	2,889	3,874	4,223	5,316	3,559
Contour Sawing and Filing Machines	959	1,030E	D	D	970	619	840	700
All Other			342	226				
Tapping Machines	378	411	328	264	303	286	412	365
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool change-Vert. & Horizontal Indexing Turret	961	796	311	327	(f)	(f)	(f)	(f)
Automatic Tool change Vertical			482	611				
Horizontal	499	429	408	548				
Transfer Machines								
Dial or Rotary	1,026	803	885	960	130	451	491	269
Way Type					91	126	64	54
Station Type, Transfer					574	517	439	318
Other, N.E.C.					203	218	185	166
Electrical Discharge Machines (EDM)	722	837	1,043	1,423	1,857	2,234	1,725	1,237
Electrochemical Machines (ECM) All Other Metal Cutting Machines	2,170(e)	2,431(e)	2,219(d,e)	3,125(d,e)	1,687	1,784	2,046	1,293

p - Preliminary. r - Revised. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 or more for 1978 to date.
(c) Included with "All Other".
(d) Excludes planers which were reported as D.
(e) Includes threading machines.
(f) Beginning with 1979 there is a new classification for Machining Centers.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980(r)	1981(r)	1982(p)
TOTAL	$677.1	$546.6	$668.1	$756.1	$836.6	$1,092.2	$1,191.5	$912.2
Average Value Under $1,000 (a)	13.1	18.0	20.7	28.3	28.6	31.7	25.7	14.7
Average Value $1,000 and Over (b)	664.0	528.6	647.4	727.8	808.6	1,060.5	1,165.8	897.5
Broaching Machines								
Hydraulic Mechanical and Other	23.9E	12.1	20.5	25.7	31.6	33.6	36.0	33.1
Planers, Shapers (Except Gear) and Slotters	1.7E		D	D	(c)	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	1.9	1.5E	2.4E	2.2	3.4	3.4	3.2	3.4
Circular Cutoff Saws	6.9	12.6	9.9	7.6	10.6	11.6	22.2	11.0
Abrasive Cutoff Saws	3.5			3.5	3.1	4.7	5.5	3.5
Band Saws	27.2	27.6	32.0	32.1	43.6	50.9	56.8	40.9
Contour Sawing and Filing Machines	11.4	14.0E	D	D	18.4	20.5	24.0	25.8
All Other			12.0	9.9				
Tapping Machines	4.4	5.2	3.8	3.3	4.8	6.7	7.2	7.7
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool Change-Vert. & Horizontal			27.3	31.3	(f)	(f)	(f)	(f)
Indexing Turret	83.8	75.0						
Automatic Tool Change								
Vertical			54.4	71.8				
Horizontal	112.9	103.4	93.4	142.9				
Transfer Machines	354.6	223.0	318.9	322.5				
Dial or Rotary					29.9	80.0	70.1	47.7
Way Type					22.2	32.8	38.7	57.8
Station Type, Transfer					494.9	592.6	684.5	505.3
Other, N.E.C.					60.6	108.1	102.8	63.8
Electrical Discharge Machines (EDM)	15.7	17.2	19.0	29.0	45.7	78.1	66.9	41.2
Electrochemical Machines (ECM) All Other Metal Cutting Machines	14.1(e)	37.0(e)	37.5(d,e)	46.0(d,e)	39.2	37.6	47.8	56.0

p - Preliminary. r - Revised. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 or over for 1978 to date.
(c) Included with "All Other".
(d) Excludes planers, which were reported as D.
(e) Includes threading machines.
(f) Beginning with 1979 there is a new classification for Machining Centers on the following page.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MACHINING CENTERS
Units and Value, 1979 to date

Products	1979	1980	1981	1982(p)
UNITS				
TOTAL	1,953	2,132	2,081	1,265
Average Value over $2,500				
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	312	298	263	155
Drill, Mill, Bore-Vertical (Automatic Tool Change)				
Y-axis Travel Less Than 20 Inches	(a)	(a)	(a)	(a)
Y-axis Travel 20 Inches—26 Inches	365	531	539	309
Y-axis Travel Over 26 Inches	188	238	280	147
Drill, Mill, Bore-Horizontal (Automatic Tool Change)				
Y-axis Travel Less Than 27 Inches	441	434	429	237
Y-axis Travel 27 Inches—40 Inches	217	205	233	166
Y-axis Travel Over 40 Inches	123	138	127	107
All Other Machining Centers	307(b)	288(b)	210(b)	144(b)
VALUE (Millions of Dollars)				
TOTAL	$356.5	$413.0	$482.7	$339.6
Average Value over $2,500				
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	30.8	32.1	32.4	22.0
Drill, Mill, Bore-Vertical (Automatic Tool Change)				
Y-axis Travel Less than 20 inches	(a)	(a)	(a)	(a)
Y-axis Travel 20 Inches—26 inches	45.7	73.8	84.7	48.1
Y-axis Travel Over 26 inches	33.9	46.7	59.4	31.8
Drill, Mill, Bore-Horizontal (Automatic Tool Change)				
Y-axis Travel Less Than 27 inches	85.9	92.2	106.7	72.3
Y-axis Travel 27 Inches—40 Inches	63.9	64.1	88.3	66.4
Y-axis Travel Over 40 Inches	69.5	75.9	80.8	79.7
All Other Machining Centers	26.8(b)	28.2(b)	30.4(b)	19.3(b)

p - Preliminary.

(a) Included in All Other Machining Centers.

(b) This category includes Y axis Travel Less than 20", Machining centers with automatic multiple spindle head changing capability and all other machining centers.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981	1982(p)
UNITS								
TOTAL	10,872	10,758	12,479	14,602	15,553	17,098	17,193	7,803
Average Value Under $1,000(a)	D	D	D	D	1,693	1,640	1,349	921
Average Value $1,000 and Over(b)	D	D	D	D	13,860	15,458	15,844	6,882
Knee Type Milling Machines (Except Bench)								
Horizontal					13,216	14,852	15,275	6,563
Plain	D	D	10,365	11,872				
Universal								
Vertical & All Other Knee Type								
Ram Type								
Bed Type Milling Machines	872	729E	644E	633				
Profile Machines and Duplicators	257	240	208	197	210	279	286	319
Die Sinking Machines	D	157E	D	D	229	327	283	
All Other Milling Machines	132	151	183	114	205			
VALUE (Millions of Dollars)								
TOTAL	$134.0	$134.4	$160.2	$194.3	$279.8	$339.3	$436.6	$303.4
Average Value Under $1,000(a)	D	D	D	D	1.0	1.0	1.0	0.6
Average Value $1,000 and Over(b)	D	D	D	D	278.9	338.3	435.6	302.8
Knee Type Milling Machines (Except Bench)								
Horizontal					174.1	215.1	231.3	110.2
Plain	D	D	93.9	111.6				
Universal								
Vertical and All Other Knee Types								
Ram Type								
Bed Type Milling Machines	22.9	17.3E	15.7E	28.9				
Profile Machines and Duplicators	15.2	18.4	18.5	14.9	66.9	96.8	157.3	192.6
Die Sinking Machines	D	1.5E	D	D	2.2	26.3	47.0	
All Other Milling Machines	19.7	25.9	30.6	36.1	35.7			

E - Estimate by NMTBA. p - Preliminary. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.

(b) Average value $2,500 and over for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1979 to Date
(Millions of Dollars)

Products	1979	1980	1981	1982(p)
UNITS				
TOTAL	15,553	17,098	17,193	7,803
All milling machines valued under $2,500	1,693	1,640	1,349	921
All milling machines valued at $2,500 and more	13,860	15,458	15,844	6,882
General-purpose, knee or bed:				
Horizontal plain, universal and ram	12,460	13,802	14,071	5,917
Vertical, except ram				
Vertical ram				
All other general-purpose type milling machines				
Automatic and manufacturing:				
Single spindle	425	483	356	217
Multiple spindle and special-purpose machines	331	567	848	429
Profile machines and duplicators	210	279	286	319
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	229	327	283	
All other milling machines N.E.C.	205			
VALUE (Millions of Dollars)				
TOTAL	$279.8	$339.3	$436.6	$303.4
All milling machines valued under $2,500	1.0	1.0	1.0	0.6
All milling machines valued at $2,500 and more	278.8	338.3	435.6	302.8
General-purpose, knee or bed:				
Horizontal plain, universal and ram	135.1	155.8	140.1	65.7
Vertical, except ram				
Vertical ram				
All other general-purpose type milling machines				
Automatic and manufacturing:				
Single spindle	21.9	27.8	37.3	21.6
Multiple spindle and special-purpose machines	17.0	31.6	53.9	22.9
Profile machines and duplicators	66.9	96.8	157.3	192.6
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	2.2	26.3	47.0	
All other milling machines N.E.C.	35.7			

p - Preliminary.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
Units and Value, 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
TOTAL	51,172	58,118	64,566	69,813	82,199	75,336	66,666	45,831
Punching, Shearing, Bending and Forming	31,709	37,256	41,316	43,903	47,805	46,017	40,602	28,265
Punching and Shearing(a)	4,863	5,084	5,262	4,774	5,745	5,396	5,423	3,513
Bending and Forming(a)	8,118	8,419	11,796	10,388	9,791	9,242	7,472	5,758
Presses, Including Forging(b)	13,517	14,302	16,194	16,655	24,418	20,428	18,030	11,666
Presses, Including Forging(a,b)	NA	NA	9,654	NA	7,432	5,764	4,123	3,048
Other Metal Forming Machine Tools	5,946	6,560	7,056	9,255	9,976	8,891	8,034	5,900
VALUE (Millions of Dollars)								
TOTAL	$615.7	$586.0	$662.1	$808.2	$1,026.8	$1,096.0	$1,064.3	$825.5
Punching, Shearing, Bending and Forming	236.4	238.8	267.9	294.3	364.6	419.1	418.9	295.4
Punching and Shearing(a)	118.9	117.4	128.2	141.3	174.3	196.7	198.1	132.2
Bending and Forming(a)	109.2	12.4	130.9	139.0	171.2	202.6	200.5	148.4
Presses, Including Forging(b)	269.5	223.6	260.7	350.9	434.0	440.8	429.6	338.9
Presses, Including Forging(a,b)	NA	NA	257.9	NA	422.1	429.9	418.6	332.4
Other Metal Forming Machine Tools	109.9	123.6	133.6	163.7	228.2	236.1	215.8	191.2

p - Preliminary. NA - Not Available. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or more beginning in 1978. (Machine tools under $1,000 for 1974-1977 and under $2,500 for 1978 are not included so the individual items do not add to the totals.)

(b) Excludes Forging for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF HYDRAULIC AND PNEUMATIC METALWORKING PRESSES
Units and Value (a), 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	NA	NA	NA	NA	87	78	39	49
Column Type	144	203	170	174	433	443	347	268
Open Rod Type	165E	305E	348	392	NA	NA	NA	NA
Gap or C-Frame	675	843	1,667	673				
15 Tons and Under					571	546	483	514
16-35 Tons					53	63	55	88
Over 35 Tons					166	140	98	
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses (b)	D	D	D	D	34	1,137(c)	702	533
All Other Hydraulic Presses	2,477(c)	1,789(c)	1,611(c)	1,363(c)	1,871(c)		1,724(c)	1,452(c)
VALUE (Millions of Dollars)								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	NA	NA	NA	NA	$18.7	$16.7	$16.3	$28.5
Column Type	$16.2	$5.3	$4.8	$16.2	9.2	11.7	8.5	7.3
Open Rod Type	4.3E	6.1E	8.7	9.4	NA	NA	NA	NA
Gap or C-Frame	4.5	3.5	8.0	7.4				
15 Ton and Under					4.9	5.2	4.6	9.7
16-35 Tons					1.3	1.5	1.6	4.7
Over 35 Tons					7.8	6.7	4.9	
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses(b)	D	D	D	D	12.8	45.8(c)	50.0	52.2
All Other Hydraulic Presses	26.9(c)	11.1(c)	17.3(c)	32.1(c)	30.7(c)		85.8(c)	102.4(c)

p - Preliminary. D - Withheld to avoid disclosure. r - Revised. E - Estimate by NMTBA. NA - Not Available.

(a) Average value $1,000 or over through 1977, $2,500 or over beginning in 1978.
(b) Figures for some types included with "All Other Hydraulic Presses".
(c) Includes horizontal.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery".

SHIPMENTS OF MECHANICAL PRESSES
Units and Value (a), 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
Open Inclinable Gap Type								
50 Tons and Under	3,045	3,598	3,373	2,140	1,374	954	642	433
51 Tons to 120 tons	791	653	898	929	1,000	717	444	255
120 Tons and over					96	103	87	D
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	64	78	D	68E	59	57	90	D
201 to 300 Tons	D							
301 Tons and Over								
Two Point								
300 Tons and Under	220	206	292	285	313	244	154	136
301 Tons and Over	130	63	66	116	97	77	46	
Four Point	D		D	D	(b)	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	211	188	167	228	622	575	389	245
51 Tons and Over	317	348E	D	D				
Knuckle Joint Horizontal	D	D	D	D	(b)	(b)	(b)	(b)
Gap and Horn Type	333	338	386	306	322	352	242	162
Bulldozers and Transfer Feed Presses All Other Mechanical Presses	241	98	133	97	329	278	305	296
VALUE (Millions of Dollars)								
Open Inclinable Gap Type								
50 Tons and Under	$11.7	$13.2	$16.2	$16.0	$20.0	$15.9	$13.4	$ 9.6
51 Tons to 120 Tons	19.5	17.5	27.2	29.3	32.4	27.5	19.1	11.0
120 Tons and Over					6.4	7.6	8.0	D
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	3.1	17.7	D	12.8E	13.9	13.2	20.7	D
201 to 300 Tons	D							
301 Tons and Over								
Two Point								
300 Tons and Under	15.5	15.8	27.4	24.3	26.7	31.3	25.5	42.8
301 Tons and Over	38.0	19.4	23.1	41.8	43.5	48.1	39.4	
Four Point	D	D	D	D	(b)	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	9.5	9.5	9.9	13.4	76.5	83.7	72.2	44.6
51 Tons and Over	23.9	36.5E	D	D				
Knuckle Joint Horizontal	D	D	D	D	(b)	(b)	(b)	(b)
Gap and Horn Type	6.9	6.2	7.1	9.7	9.2	10.0	5.6	4.5
Bulldozers and Transfer Feed Presses All Other Mechanical Presses	29.1	12.1	22.1	30.5	108.1	104.9	129.0	103.3

p - Preliminary. E - Estimate by NMTBA. D - Withheld to avoid disclosure. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.
(b) Included with "All Other Mechanical Presses".

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES
Units and Value (a), 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	1,680	1,790	1,653	1,575	2,387	2,300	2,512	1,663
Punching Machines, Fixed Position & Two Axes Positioning Table	D	853	767	768	938	822	678	407
Plate Shearing Machines	1,312	1,332	1,254	1,318	1,618	1,481	1,352	926
Bar and Angle, and Rotary Shearing Machines	278	179	234	339	275	186	186	152
Other Power Operated Punching and Shearing Machines	415	546	507	551	527	607	695	365
Manually Operated Punching and Shearing Machines	D	384	847	223				
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	521	483	450	417	657	503	409	258
Bending Rolls, Angles, Bars and Shapes (Power)	63	1,440	1,548	1,847		231	300	113
Press Brakes and Folders (Power) (d)	1,331				(b)	(b)	(b)	(b)
Mechanical					588	824	548	335
Hydraulic					856	1,540	904	609
Hydro-Mechanical					622		350	262
Rotary Bending and Forming (Power)	2,623	2,453	3,523	2,334	1,655	1,275	1,200	1,051
Rotary Head and Ram Bending (Power)				1,588	1,487(c)	1,287(c)	1,017(c)	766
Other Bending and Forming Machines (Power or Manual)	3,580	4,043	6,275	4,202	3,926	3,582	2,744	2,364
VALUE (Millions of Dollars)								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	$11.1	$15.7	$15.4	$14.0	$20.8	$21.7	$26.0	$17.2
Punching Machines, Fixed Position & Two Axes Positioning Table	D	44.6	54.2	64.6	81.4	95.1	84.8	45.7
Plate Shearing Machines	41.3	44.1	44.3	46.6	53.6	61.0	65.9	55.1
Bar and Angle, and Rotary Shearing Machines	4.7	3.5	2.4	2.6	3.3	1.6	3.0	1.8
Other Power Operated Punching and Shearing Machines	15.7	8.7	10.1	13.0	15.2	17.4	18.3	12.3
Manually Operated Punching and Shearing Machines	D	.8	1.8	.6				
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	9.0	9.7	9.4	9.4	34.1	24.2	25.7	13.8
Bending Rolls, Angles, Bars and Shapes (Power)	2.3	39.6	43.6	52.9		13.1	15.9	13.3
Press Brakes and Folders (Power) (d)	32.5				(b)	(b)	(b)	(b)
Mechanical					10.8	15.2	12.5	6.3
Hydraulic					30.0	50.8	40.7	27.7
Hydro-Mechanical					10.0		9.1	5.8
Rotary Bending and Forming (Power)	24.0	27.2	26.5	19.7	19.3	26.4	23.6	24.4
Rotary Head and Ram Bending (Power)				14.9	16.1(c)	14.3(c)	15.1(c)	9.5(c)
Other Bending and Forming Machines (Power or Manual)	41.4	35.9	51.4	42.1	51.0	58.6	57.9	47.6

D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977, $2,500 or over beginning in 1978.
(b) Folders included in Other.
(c) Ram and Press Bending Only, Rotary Head is a part of Rotary Bending and Forming.
(d) The detail for press brakes is not available prior to 1979.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF FORGING AND OTHER METAL FORMING MACHINE TOOLS
Units and Value (a), 1975 to Date

Products	1975	1976	1977	1978	1979	1980	1981(r)	1982(p)
UNITS								
Forging Machines(Except Presses) (b)	519	545	494	533	609	631	479	381
Riveting Machines (Except Portables)	1,389	2,707	2,969	3,346	3,246	2,025	1,764	1,320
Thread Rolling Machinery	242	212	203	232	233	202	150	111
Die Casting Machines								
Under 500 Tons	NA	NA	NA	NA	90	123	112	75
501 Tons and Over	NA	NA	NA	NA	136	94	56	31
Spinning Lathes	D	D	D	D	2,851	2,766	2,326	1,873
Marking Machines, Knurling Machines								
Electroforming & Others	2,513	1,922	2,160	2,568				
Metal Container Making Machines								616
VALUE (Millions of Dollars)								
Forging Machines (Except Presses) (b)	$39.5	$52.2	$51.1	$59.3	$64.7	$73.8	$79.0	$77.2
Riveting Machines (Except Portables)	12.1	13.0	14.6	13.7	15.8	21.9	24.3	14.6
Thread Rolling Machinery	6.4	6.3	7.1	8.3	9.4	8.9	8.5	7.2
Die Casting Machines								
Under 500 Tons	NA	NA	NA	NA	7.6	12.4	11.5	8.0
501 Tons and Over	NA	NA	NA	NA	30.9	27.1	15.1	8.7
Spinning Lathes	D	D	D	D	75.3	88.0	73.1	44.9
Marking Machines, Knurling Machines								
Electroforming & Others	46.7	49.2	52.3	72.1				
Metal Container Making Machines								28.3

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.
(b) Includes forging presses for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

INDUSTRIES MANUFACTURING MACHINE TOOLS

Value of Shipments, by Industry, by Type, 1972 and 1977

(Millions of Dollars)

	All Industries		Shipped by					
			Metal Cutting Machine Tool Industry SIC 3541	Metal Forming Machine Tool Industry SIC 3542	Special Dies, Tools, Jigs, & Fixtures Industry SIC 3544	Machine Tool Accessories Industry SIC 3545	Metal Working Machinery N.E.C. Industry SIC 3549	Other Industries
	1972	1977	1977					
Metal Cutting Machine Tools								
Total	$1,259	$2,561	$2,354	$ 31	$14	$48	$D	$102
Boring Machines	59	94	90	—	D	D	D	D
Drilling Machines	74	109	103	—	—	D	D	D
Gear Cutting & Finishing	57	67	53	D	—	D	—	D
Grinding & Polishing	169	288	244	D	—	D	D	29
Lathes	198	456	447	D	—	D	D	6
Milling Machines	87	168	150	12	—	—	D	D
Other Machine Tools (a)	303	714	660	(d)	D	10	D	22
Parts Sold Separately (b)	242	502	461	8	D	8	D	20
Not Specified	71	163	146	(c)	8	3	(c)	5
Metal Forming Machine Tools								
Total	$ 670	$1,115	$ 35	$967	$ 2	$ 4	$4	$103
Punching, Shearing, Bending, and Forming Machines	153	280	5	257	D	D	D	D
Presses, incl. Forging Presses	183	283	D	241	—	D	D	D
Other Metal Forming Tools	149	172	D	140	D	D	D	D
Parts & Rebuilt Machines	162	296	15	244	D	D	2	D
Not Specified	23	85	—	84	—	—	—	(c)

D - Witheld to avoid disclosure. N.E.C. - Not elsewhere classified.

(a) Includes machine tools for home workshops, laboratories, etc.
(b) Includes rebuilt machine tools.
(c) Under $2 million.
(d) Over $2 million.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977; MC77(2)-35C" and earlier issues.

Machine tools are "primary products" of the metal cutting and metal forming machine tool industries (SIC 3541 and 3542). However, other industries also manufacture machine tools as "secondary products". In turn, the machine tool industry produces some products other than machine tools.

MILITARY PRIME CONTRACT AWARDS FOR MACHINE TOOLS

Fiscal Years 1979 to Date

(Thousands of Dollars)

	Year ending June 30			
	1979	1980(r)	1981	1982
Saws and filing machines	$ 2,212	$ 2,115	$ 2,142	$ 2,339
Machining centers and way type machines	6,793	2,883	4,155	10,035
Electrical and ultrasonic erosion machines	545	499	382	801
Boring machines	3,337	6,640	3,414	7,741
Broaching machines	104	38	839	12
Drilling machines and tapping machines	6,671	1,413	1,372	8,556
Gear cutting and finishing machines	0	-40	163	151
Grinding machines	5,147	9,969	17,681	7,336
Lathes	9,974	24,032	23,645	15,003
Milling machines	5904	11,252	12,248	9,805
Planers and shapers	966	183	400	908
Miscel. machine tools	146,276	115,512	27,594	4,416
Total metal cutting machine tools	$187,929	$174,496	$ 94,035	$67,103
Bending and forming machines	$ 2,244	$ 3,662	$ 2,524	$ 5,338
Hydraulic and pneumatic presses	1,041	952	2,102	1,938
Mechanical presses, power driven	381	299	755	761
Manual presses	163	156	430	476
Punching and shearing machines	2,448	2,521	4,342	3,653
Forging machinery and hammers	191	214	398	1,041
Wire and metal ribbon forming machines	843	42	474	42
Riveting machines	129	117	151	220
Miscel. secondary forming & cutting mach.	58,474	32,688	128,578	-48,489
Total metal forming machine tools	$ 65,914	$ 40,651	$139,754	-35,020
Total Machine Tools	$253,843	$215,147	$233,789	$32,083

r - Revised.

Source: Department of Defense, OASD (Comptroller), "Military Prime Contract Awards, by Service Category and Federal Supply Classification".

5

U. S. MACHINE TOOL FOREIGN TRADE

Machine tool exports are an important factor to the health and stability of the machine tool industry. While domestic new orders have been subject to violent cycles, foreign orders have shown considerably greater stability. Overseas sales have thereby provided American builders a buffer against business cycle flucuations and a consistently growing market for their products.

Both exports and imports of machine tools have grown at a much faster rate than domestic shipments. In the ten year interval between 1972 and 1981, exports grew from $260 million to over $1.0 billion, an increase of almost 300%. Over the same time period the growth of imports was even more pronounced, growing from $90 million to just under $1.5 billion, and since 1978, producing a net deficit in the U.S. machine tool balance of trade.

The 1982 recession in the world's industrial countries led to a substantial decline in U.S. machine tool trade for the year. U.S. exports fell some 40% to $615 million. Imports also fell, from $1.5 billion to $1.25 billion, but were still large enough to produce a trade deficit of over $640 million, the largest in the industry's history. Though imports were down, their decline was less than that of the market as a whole. As a result, the import share of U.S. machine tool consumption rose again, from 1981's 24.4% to 26.8% for 1982.

United States Foreign Trade Statistics

The most widely used data on foreign trade are the Census Bureau reports on exports and imports. Exports and imports are compiled from copies of the shipper's own declaration filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Freight, insurance, and other charges are included, thus giving exports a value higher than that of the machine tool at the manufacturer's plant.

The Census data include shipments by manufacturers and by others such as dealers and distributors. They also include exports of rebuilt machine tools, replacement parts, and machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking.

While the Census export figures tend to show a value higher than the value of the machines at the manufacturer's plant, import figures show values considerably lower than those paid by the purchaser of foreign machine tools. Values are, in general, based on the market value, or price, in the foreign country at the time of exportation and include the cost of containers and coverings as well as other charges and expenses incidental to placing the merchandise into condition for shipment to the United States. However, they exclude import duties, insurance, ocean freight, and other charges incidental to the arrival of the goods in the United States.

As a result of these and other factors inflating the "value" of the exports and deflating the "value" of the imports, the impact of imports is greater than that shown in most tables in this chapter. The negative balance of trade, correspondingly, is larger than shown.

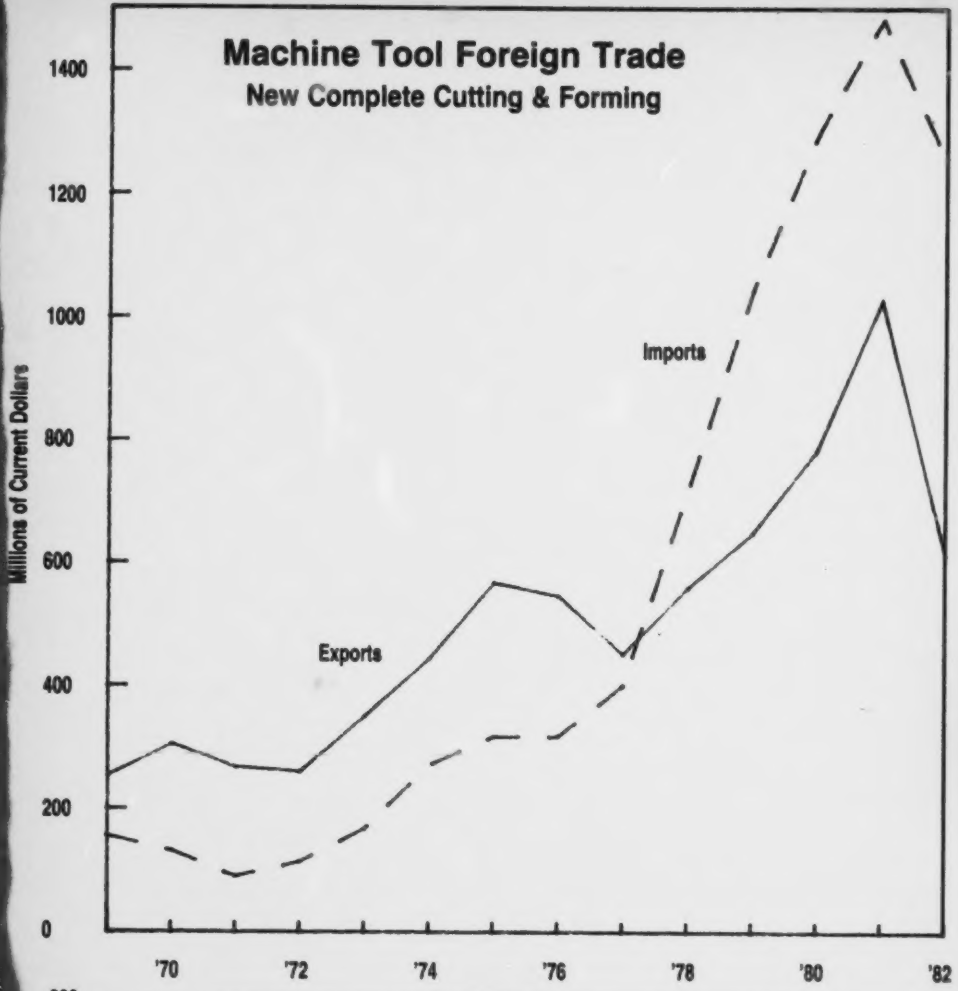
There are two additional export series with a more limited scope but considered more accurate by the industry.

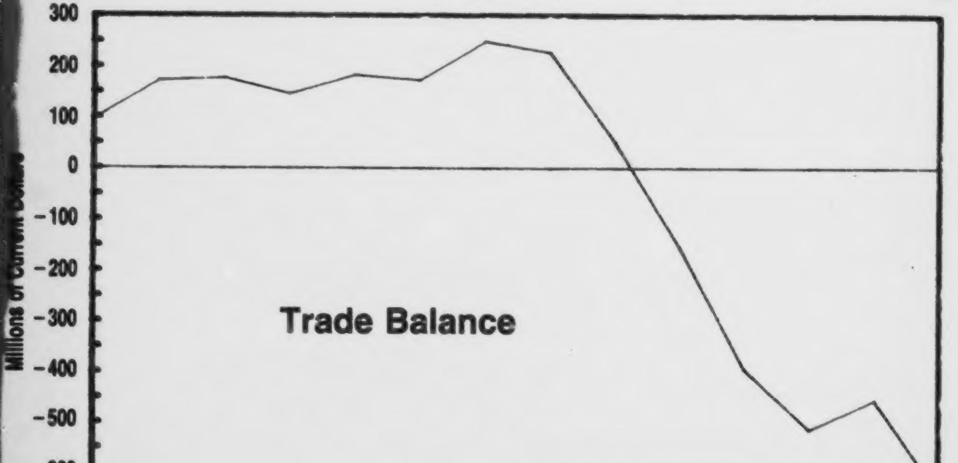
The first is a series on foreign orders and shipments that is part of the NMTBA "Industry Estimates of New Orders, Cancellations, Shipments, and Backlog," published monthly for the entire industry (see Chapter 4 for details on this report).

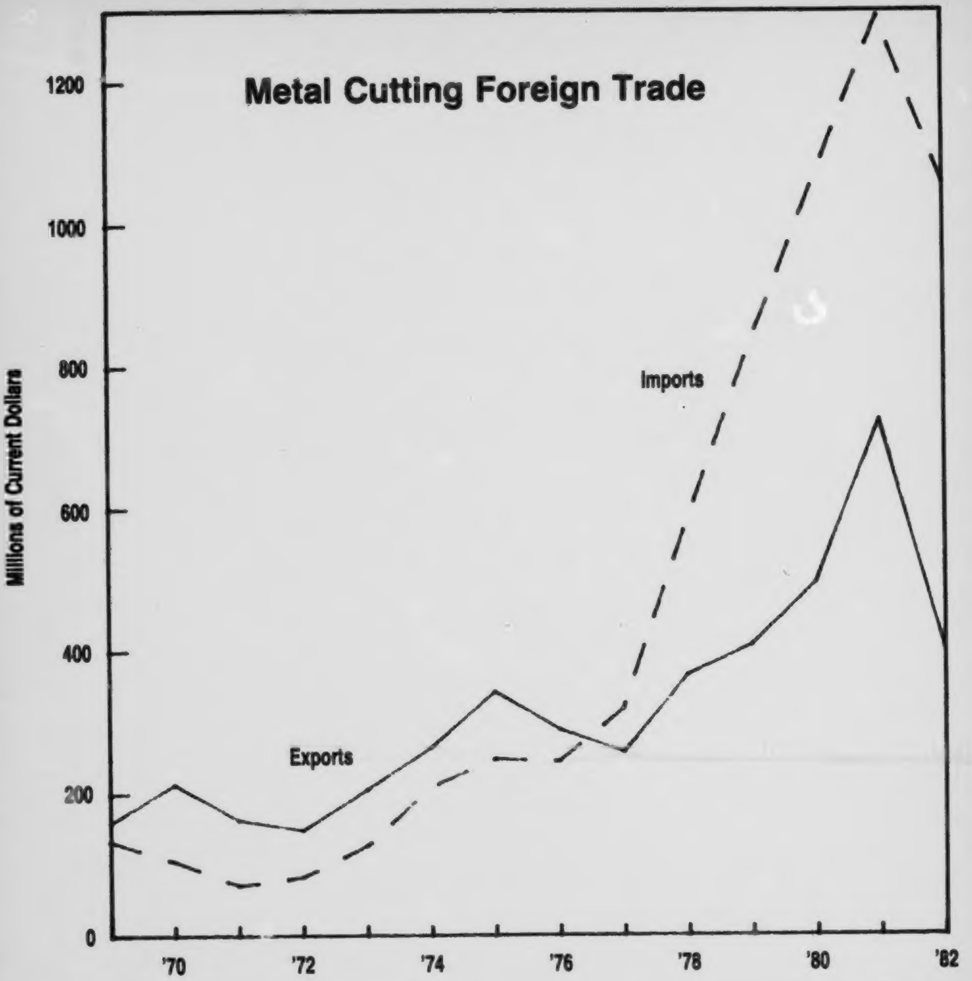
The other is the series on exports, based on manufacturers' shipments for export, published in the MQ-35W series by the Department of Commerce (see Chapter 4 for details). This report shows manufacturers' shipments of new and complete machine tools for 12 major machine tool categories. It also shows the historical quantity and value of exports for about 15 selected types of machine tools through 1972, but only the value of exports from 1973 forward.

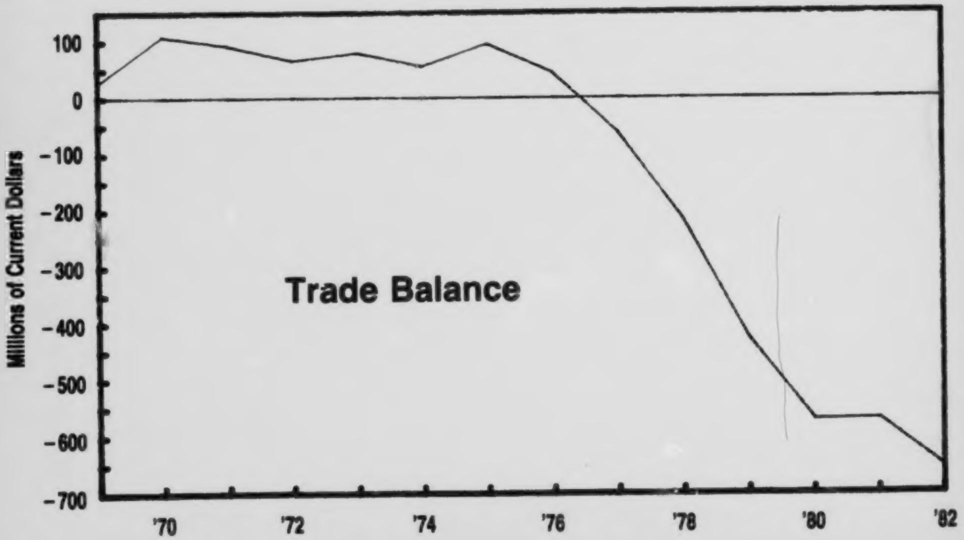
The two major reasons the Census data are the most widely used in spite of their shortcomings are that (1) the Census series on imports is the only one available, and (2) the two Census series on exports and imports include a similar broad "universe" (new, used, and rebuilt machines and home-workshop type machine tools).

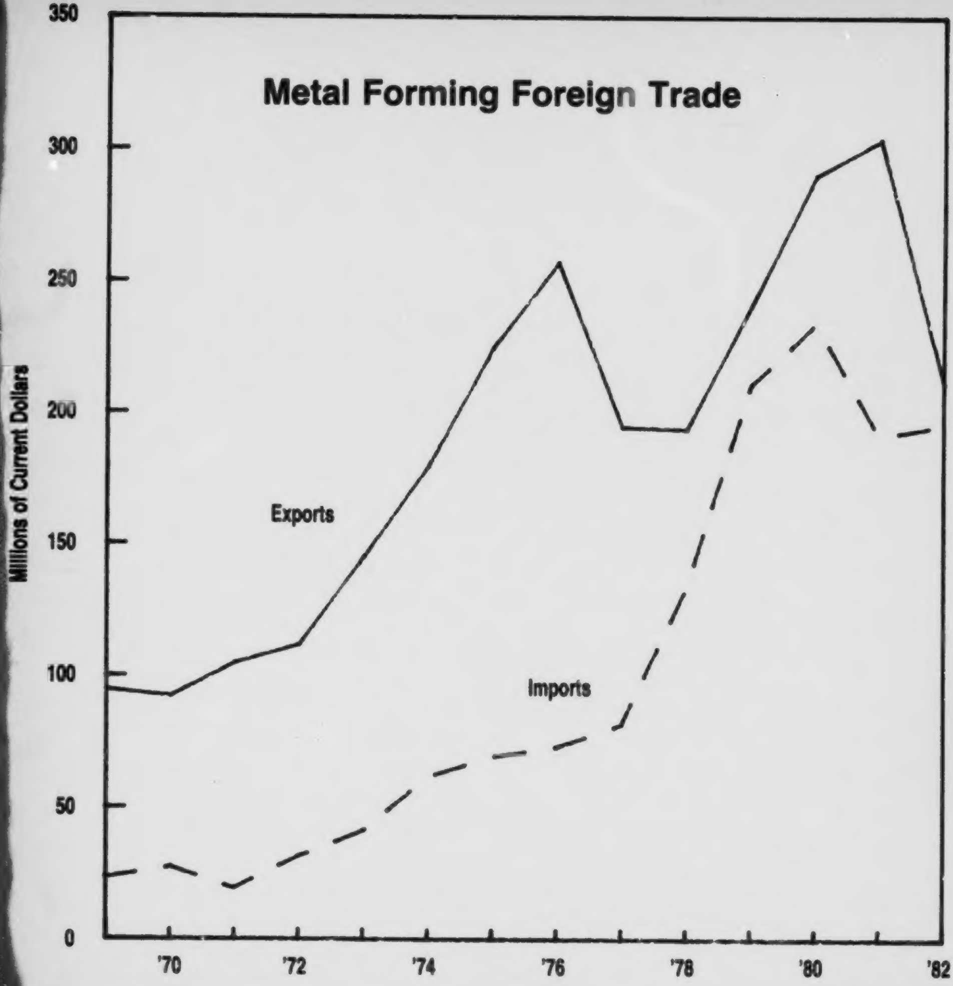
Beginning with 1980 data, the commodity descriptions and classification numbers for machine tools were revised. Although the machine tool categories differ slightly, the resulting TSUSA export and Schedule B import classification codes are comparable and permit direct comparisons of foreign trade by product types. Foreign trade data are also comparable to U.S. production data (MQ-35W, see Chapter 4), permitting the calculation of U.S. consumption of machine tools for a variety of product types.

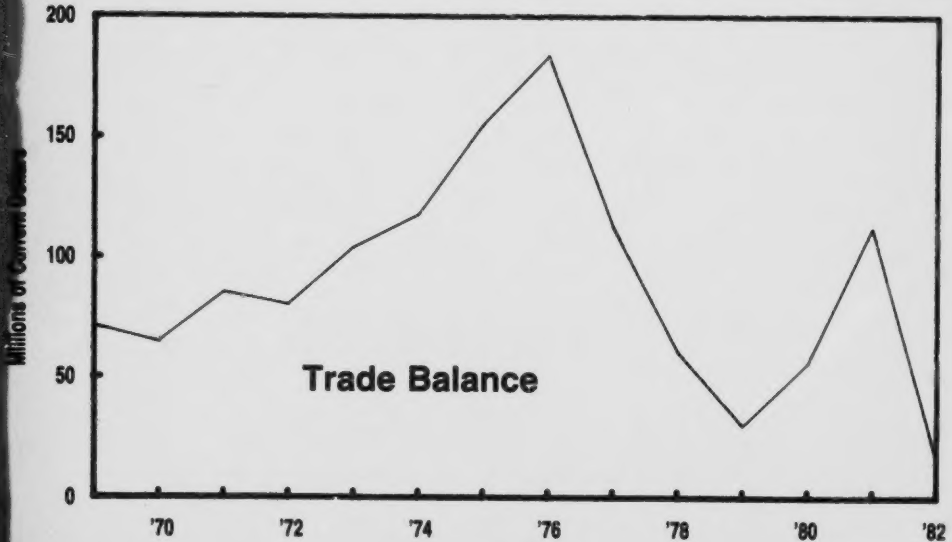

Machine Tool Foreign Trade
New Complete Cutting & Forming
Millions of Current Dollars
1400
1200
1000
800
600
400
200
0
Imports
Exports
'70
'72
'74
'76
'78
'80
'82


Trade Balance
Millions of Current Dollars
300
200
100
0
-100
-200
-300
-400
-500
-600
'70
'72
'74
'76
'78
'80
'82


Metal Cutting Foreign Trade
Millions of Current Dollars
1200
1000
800
600
400
200
0
Imports
Exports
'70
'72
'74
'76
'78
'80
'82


100
0
-100
-200
-300
-400
-500
-600
-700
Millions of Current Dollars
Trade Balance
'70
'72
'74
'76
'78
'80
'82


Metal Forming Foreign Trade
Millions of Current Dollars
350
300
250
200
150
100
50
0
Exports
Imports
'70
'72
'74
'76
'78
'80
'82


Trade Balance
Millions of Current Dollars
200
150
100
50
0
'70
'72
'74
'76
'78
'80
'82

U.S. MACHINE TOOL IMPORTS AS A PERCENTAGE OF U.S. MACHINE TOOL CONSUMPTION

By Types Based on Dollar Value (a), 1974 to Date

	1974	1975	1976	1977	1978	1979	1980r	1981r	1982
All Machine Tools	12.7%	13.8%	14.9%	15.6%	21.3%	22.2%	23.2%	24.4%	26.8%
Metal Cutting Types	13.9	14.5	15.6	16.8	23.0	23.2	24.2	26.1	28.2
Metal Forming Types	7.9	11.8	13.0	12.4	16.1	18.7	19.6	17.0	21.3
Gear Cutting & Hobbing Types	16.0	27.2	24.9	NA	NA	NA	37.4E	41.1E	34.4E
Drilling Types	10.9	10.1	14.2	16.2	11.3	14.6	14.8	19.7	18.4
Lathes (b)	19.2	17.3	18.6	23.9	31.3	39.5	34.8	40.9	44.1E
Grinding & Polishing Machines	14.2	13.2	14.8	14.3	18.6	16.2	24.1	21.2	23.6
Milling Machines	13.5	17.0	18.0	NA	NA	24.3	30.8	23.6	23.7
Boring Machines (c)	22.3	29.5	26.5	30.7	30.8E	29.6	24.7	29.2	24.8

NA - Not Available. E - Estimate. r - Revised.

(a) Based on shipments of complete machine tools with values greater than $2,500, where possible.
(b) Excludes Vertical Turret Lathes prior to 1980; from 1980 to date includes all lathes.
(c) Includes Vertical Turret Lathes prior to 1980; from 1980 to date includes boring machines only.

Sources: U.S. Dept. of Commerce: "Current Industrial Reports, Series MQ-35W, Metalworking Machinery", and U.S. Bureau of the Census. "IM 146".

UNITED STATES PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF MACHINE TOOLS, 1964 to Date

(Millions of Dollars)

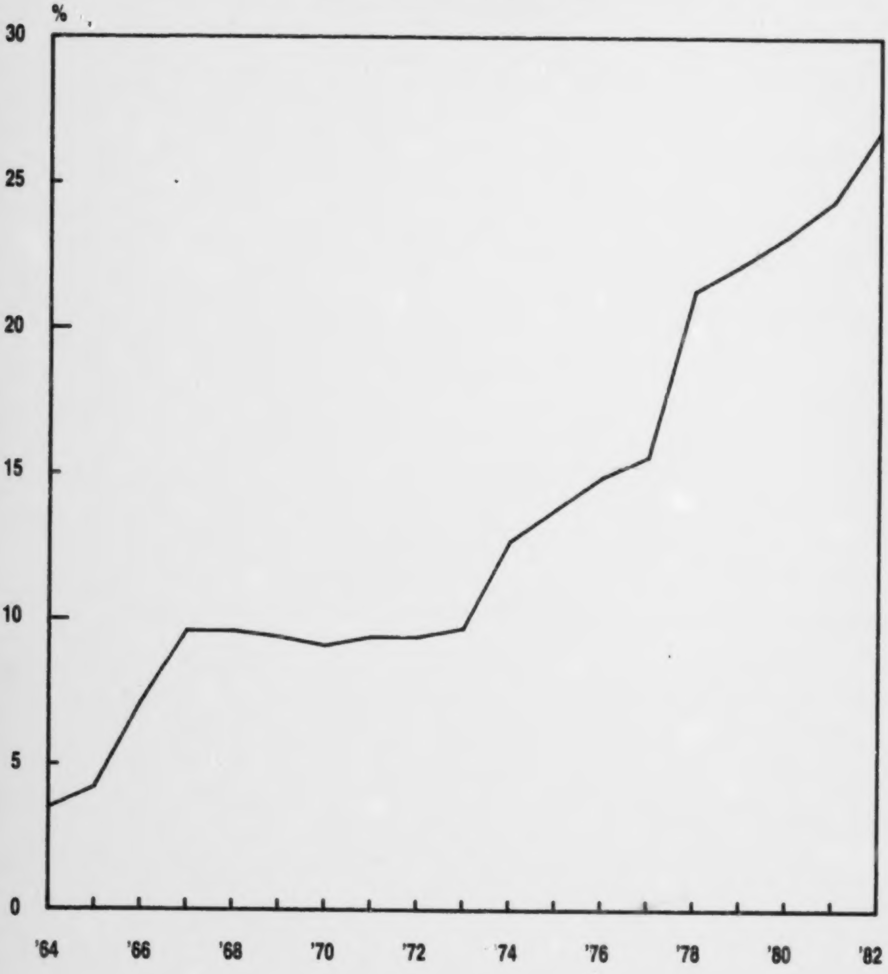
Year	Production	Exports	Imports	Domestic Consumption
1964	$1,209.1	$198.6	$ 36.3	$1,046.8
1965	1,457.7	171.3	56.3	1,342.7
1966	1,712.8	173.2	117.8	1,657.4
1967	1,869.3	194.1	178.1	1,853.3
1968	1,722.7	174.5	163.6	1,711.8
1969	1,692.2	181.5	156.1	1,666.8
1970	1,551.8	238.8	131.8	1,444.8
1971	1,057.9	191.0	90.1	957.0
1972	1,269.3	171.1	114.0	1,212.2
1973	1,787.9	224.7	167.1	1,730.3
1974	2,165.9	310.2	270.9	2,126.4
1975	2,406.1	423.6	317.6	2,300.1
1976	2,178.3	352.3	318.3	2,144.3
1977	2,440.7	279.1	400.9	2,562.5
1978	3,004.3	371.0	715.3	3,348.6
1979	4,064.0	395.6	1,043.8	4,722.3
1980	4,812.3	630.8	1,259.8	5,441.4
1981(r)	5,111.3	675.0	1,431.5	5,867.8
1982(p)	3,744.3	426.6	1,217.7	4,535.4

p - Preliminary. r - Revised.

Note: Production and export figures are those reported by domestic manufacturers in the MQ-35W. Import figures are taken from the Department of Commerce's "IM146" report and do not include the value of used and rebuilt machines.

Source: NMTBA, "Current Industrial Reports; Metalworking Series, MQ-35W", U.S. Department of Commerce Trade Statistics.

U.S. Machine Tool Imports as a Percentage of U.S. Machine Tool Consumption



The government import statistics used on this and the previous page represent machine tool values in the originating foreign country. They exclude import duties, freight insurance and other charges incurred in bringing the machines to the United States and thus understate the imports' actual cost. A conservative adjustment reflecting these value-adding charges results in a slightly higher proportion of U.S. consumption being accounted for by imports. For example, the adjusted 1982 import share of U.S. machine tool consumption was 32.3% as compared with an unadjusted share of 26.8%.

U.S. IMPORTS OF MACHINE TOOLS (a)

Major Countries of Origin, 1971 to Date

(Millions of Dollars)

Country of Origin	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
TOTAL	$90.1	$114.0	$167.1	$270.7	$317.6	$318.3	$400.9	$715.3	$1,043.8	$1,298.5	$1,482.9	$1,253.3
Austria	.7	1.3	.9	1.8	3.2	2.0	1.0	2.3	3.7	2.3	2.1	15.8
Belgium	.8	1.8	1.5	5.3	6.4	3.1	4.9	8.0	12.6	16.7	18.5	9.1
Czechoslovakia	.8	1.8	1.1	2.6	2.8	3.5	2.9	3.9	4.6	5.7	4.7	2.0
Denmark	.6	.8	.7	1.4	1.1	1.0	.7	2.5	3.3	3.7	2.9	2.2
France	2.5	3.0	9.9	13.4	16.2	9.5	9.7	17.4	21.4	24.9	26.5	12.9
Germany (East)	.1	.3	.3	.3	.6	.8	.7	1.8	1.9	2.0	2.9	3.1
Germany (West)	30.8	39.2	51.6	78.0	96.0	93.3	91.2	154.8	197.0	235.9	192.3	204.6
Italy	7.7	7.6	10.1	16.8	15.5	14.6	15.1	25.4	37.5	44.1	42.9	45.0
Netherlands	.8	1.1	1.7	2.4	1.3	1.1	1.9	2.7	5.5	6.1	4.9	2.6
Norway	.2	.3	.3	.6	.4	.1	.6	.4	.6	.3	.8	1.0
Poland	.1	.5	1.7	5.2	2.2	2.8	7.2	12.8	19.2	15.6	15.8	7.5
Spain	1.4	2.5	4.2	6.8	6.4	6.9	7.7	13.4	20.6	27.1	24.3	20.6
Sweden	3.2	3.0	5.5	8.9	9.9	8.4	11.5	18.3	31.3	29.3	28.3	23.4
Switzerland	10.5	11.8	20.0	29.3	27.0	28.6	35.3	57.6	66.0	81.5	78.4	71.8
United Kingdom	11.4	15.0	21.9	31.0	39.3	32.0	46.1	74.0	96.9	117.3	136.1	107.5
Canada	7.0	7.0	9.5	12.7	15.0	14.9	19.2	27.0	34.2	47.9	44.0	36.6
Japan	9.8	14.7	22.0	47.4	62.6	67.3	105.7	220.6	353.3	492.0	687.5	529.2
Taiwan	.1	.2	.8	2.4	2.7	13.0	22.6	48.8	85.7	93.6	102.4	90.9
Other Countries	1.4	2.0	3.3	4.4	8.8	15.4	16.9	22.5	48.5	52.5	67.6	67.5

(a) Data does not include parts.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

U.S. IMPORTS OF CUTTING AND FORMING MACHINE TOOLS (b)

Major Countries of Origin, 1971 to Date

(Millions of Dollars)

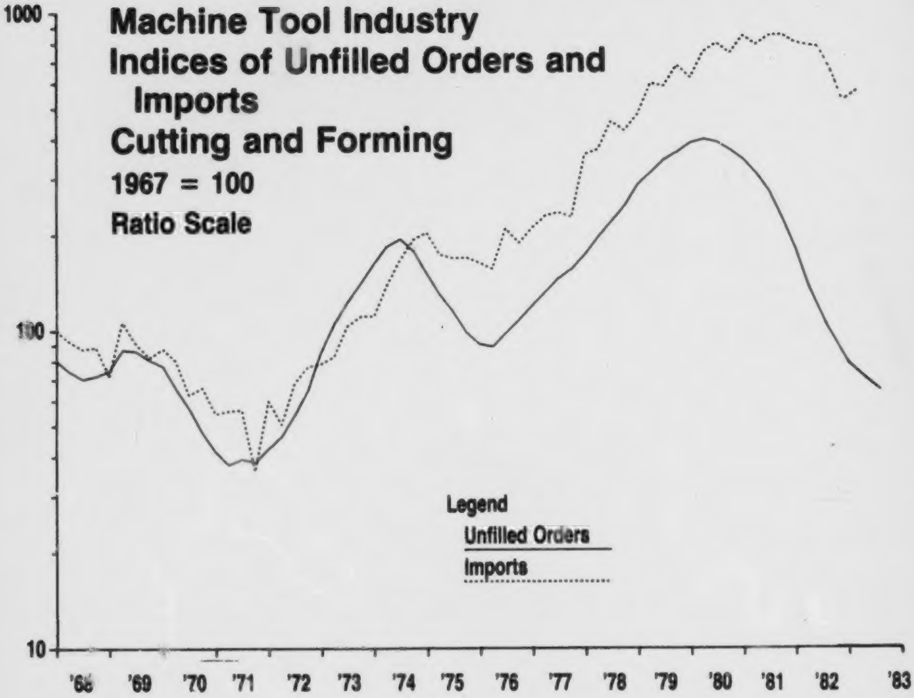
Country of Origin	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
CUTTING TOTAL	$70.8	$82.5	$126.0	$209.1	$248.1	$245.3	$319.2	$582.2	$833.1	$1,064.4	$1,291.5	$1,057.4
Austria	.5	.7	.7	1.3	1.6	1.9	1.0	1.8	2.6	1.4	2.0	3.1
Belgium	.4	.6	.8	1.7	2.6	1.2	4.3	4.5	6.2	8.0	10.8	5.6
Czechoslovakia	.8	1.8	1.1	2.6	2.8	3.5	2.9	3.9	4.4	5.5	4.6	2.0
Denmark	.4	.4	.4	.7	.6	.9	.5	1.8	1.5	2.4	1.3	1.2
France	2.0	2.4	8.7	11.6	14.9	7.8	9.7	13.8	17.5	22.3	20.6	9.3
Germany (East)	.1	.3	.3	.3	.6	.7	.7	1.6	1.8	1.9	2.9	3.1
Germany (West)	24.4	23.7	35.3	53.0	69.0	59.7	60.3	104.0	117.0	150.2	148.4	155.0
Italy	5.6	5.9	6.9	11.6	11.3	11.3	11.1	19.6	23.9	34.2	31.6	36.5
Netherlands	.8	.9	1.3	1.9	1.0	1.0	1.0	2.4	4.3	5.4	4.3	2.1
Poland	.1	.5	1.7	5.0	2.2	2.8	7.2	12.6	19.1	15.5	15.8	7.5
Spain	1.3	2.4	4.0	6.4	6.0	6.2	7.3	13.0	18.9	24.3	21.9	19.0
Sweden	2.6	2.5	4.7	7.8	7.5	7.0	9.6	12.9	21.7	19.9	19.9	14.9
Switzerland	8.1	9.2	14.3	23.1	20.9	22.5	28.1	47.7	53.9	65.9	65.4	61.1
United Kingdom	8.9	11.2	117.1	26.6	34.2	27.8	39.2	64.0	86.7	103.8	120.5	94.1
Canada	4.7	4.6	5.7	7.7	8.5	8.9	11.0	16.2	18.1	29.1	28.2	22.4
Japan	9.0	13.4	19.1	41.0	53.1	54.8	89.1	193.7	305.9	433.4	627.4	467.8
Taiwan	.1	.2	.8	2.4	2.7	12.8	22.5	47.9	85.3	93.1	101.6	89.9
Other Countries	1.1	1.8	3.0	3.9	8.6	14.5	13.7	20.6	44.3	48.1	64.3	62.8
FORMING TOTAL	$19.2	$31.4	$41.1	$61.6	$69.4	$73.0	$81.7	$133.1	$210.7	$234.1	$191.4	$196.0
Austria	.3	.6	.2	.5	1.6	.1	(a)	.5	1.1	.9	.1	12.8
Belgium	.4	1.2	.7	3.6	3.8	1.9	.5	3.5	6.4	8.7	7.7	3.5
Germany (West)	6.5	15.5	16.3	25.0	27.0	33.6	30.9	50.7	80.1	85.7	44.0	49.6
France	.5	.7	1.2	1.8	1.4	1.7	2.4	3.6	4.0	2.5	5.9	3.6
Italy	2.0	1.7	3.2	5.2	4.2	3.2	4.0	5.8	13.6	9.9	11.3	8.6
Sweden	.6	.6	.8	1.1	2.4	1.4	2.0	5.4	9.6	9.3	8.3	8.5
Switzerland	2.4	2.6	5.7	6.3	6.1	6.2	7.2	9.9	12.1	15.7	13.0	10.7
United Kingdom	2.5	3.7	4.8	4.4	5.1	4.2	6.9	10.9	10.2	13.6	15.6	13.5
Canada	2.3	2.4	3.8	5.0	6.5	6.0	8.3	.3	16.1	18.8	15.8	14.2
Japan	.7	1.3	2.9	6.4	9.5	12.5	16.6	26.9	47.4	58.6	60.1	61.5
Other Countries	.9	1.1	1.4	.5	1.8	2.2	2.9	15.6	10.1	10.4	9.6	9.5

(a) Less than $50,000; included in "Other Countries".

(b) Data does not include parts.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.



Machine Tool Industry
Indices of Unfilled Orders and Imports
Cutting and Forming
1967 = 100
Ratio Scale

UNITED STATES IMPORTS OF MACHINE TOOLS AND PARTS
By Machine Classification, 1971 to Date

(Millions of Dollars)

Machine Classification	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980r	1981r	1982
GRAND TOTAL	$109.6	$141.8	$211.6	$330.3	$382.4	$383.3	$482.2	$832.4	$1,269.5	$1,556.9	$1,712.9	$1,489.4
METAL CUTTING	87.4	104.3	164.6	261.3	303.0	293.6	386.7	681.6	1,027.6	1,282.2	1,485.1	1,258.1
Complete Machines	70.9	82.5	126.0	209.1	248.1	245.3	319.2	582.2	833.1	1,029.2	1245.6	1,057.4
Gear Cutting or Hobbing	3.7	4.5	4.7	10.7	20.7	16.9	13.5	25.9	28.4	29.4	37.0	25.8
Drilling	2.9	4.3	5.6	8.8	9.4	15.3	19.6	18.7	25.0	27.2	26.4	20.7
Milling	7.9	7.5	12.4	19.8	23.3	25.9	27.9	47.7	83.1	138.1	124.7	87.7
Machining Centers	(a)	(a)	(a)	(a)	(a)	(a)	(a)	22.0	39.6	93.4	195.7	166.9
Boring and Vertical Turret Lathes	11.6	13.6	14.4	28.8	41.1	41.0	51.8	65.9	70.7	76.9	86.7	78.8
Lathes (Exc. Vertical Turret Lathes)	17.8	22.9	45.7	73.1	77.0	77.0	113.9	219.4	353.6	380.0	479.8	338.6
Grinding	11.6	12.7	20.0	32.4	34.5	32.2	39.2	68.1	85.2	150.5	137.2	117.6
Other	15.5	17.1	23.3	35.5	42.5	37.1	53.3	63.6	82.4	84.4	87.2	98.7
Metal Cutting, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	(b)	(b)	50.9	65.1	50.0	70.9	68.9
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	35.2	45.9	31.7
Parts	16.5	21.7	38.6	52.2	54.8	48.3	67.5	99.5	194.5	217.8	193.6	200.7
METAL FORMING	22.2	37.6	47.0	68.9	79.4	89.7	95.5	150.7	241.9	274.7	227.8	231.3
Complete Machines	19.2	31.4	41.1	61.6	69.4	73.0	81.7	133.1	210.7	230.6	185.9	196.0
Metal Forming, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	(b)	(b)	4.1	4.5	3.9	4.5	4.6
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	3.5	5.5	3.9
Parts	3.0	6.1	5.9	7.3	10.0	16.7	13.8	17.6	31.2	40.6	36.3	35.4

r - Revised.

(a) Included in "Other Metal Cutting Machine Tools".

(b) Included in respective machine classifications.

Note: Individual items may not add to totals due to rounding. This table is based on a set of classifications which was expanded in 1978. A separate table on the following page reports import data for 1981 and 1982 using the more detailed machine tool categories.

Source: U.S. Department of Commerce, Bureau of the Census. "IM 146" and earlier publications.

It should be noted that machine tool imports, as reflected in government statistics, are actually undervalued. They reflect values in the country of origin and do not include ocean freight, insurance, dealer commissions or import duties. The purchaser in this country is paying significantly more for imported machine tools than is reported in the import statistics.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1981 and 1982

(Value in Thousands of Dollars)

Machine Classification	1981		1982	
	Units	Value	Units	Value
GRAND TOTAL	940,945	$1,485,105(a)	1,202,511	$1,258,062(a)
Complete New Machines	935,374	1,245,556	1,190,835	1,025,679
Gear Hobbers	213	19,366	117	13,082
Gear Shapers	12	1,846	13	906
Gear Cutting Machines, N.E.C.	19	3,942	17	2,364
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	1,127	90,723	1,002	81,062
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	121	16,825	122	17,093
Horizontal Machining Centers, ATC, NC	381	52,634	401	51,713
Machining Center, NC, N.E.C.	376	35,533	348	38,997
Single Station and Multi-Station Transfer Machines	35	8,259	50	7,462
Way Type Machines (Unit Heads)	2	219	—	—
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	20	5,199	16	3,354
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	—	—	—	—
Vertical Boring-Drilling-Milling Machines, NC	23	3,987	78	12,345
Horiz. Boring-Drilling-Milling Machines, non-NC	211	22,017	115	13,184
Vertical Boring-Drilling-Milling Machines, non-NC	2,224	18,676	2,550	15,379
Drilling Machines, NC	29	2,016	12	1,537
Drilling Machines, Multi-Spindle, non-NC	80	3,923	56	3,050
Drilling Machines, Radial, non-NC	1,485	12,095	825	7,405
Drilling Machines, Upright, Single Spindle, non-NC	234	1,439	138	950
Drilling Machines, non-NC, N.E.C.	410	6,967	286	7,769
Milling Machines, NC	379	27,406	215	15,539
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	338	6,181	167	6,717
Milling Machines, Knee Type, non-NC	4,041	30,975	2,902	26,780
Milling Machines, Bed Type, non-NC	626	16,841	190	8,556
Milling Machines, non-NC, N.E.C.	5,050	43,323	2,511	30,091
Vertical Boring Machines, incl. VTL's NC	33	5,370	46	9,275
Vertical Boring Machines, incl. VTL's, non-NC	322	10,947	166	10,340
Boring Machines, NC, N.E.C.	16	4,414	10	1,849
Boring Machines, non-NC, N.E.C.	309	16,080	159	13,095
Horizontal Lathes, NC, Less Than 25 HP	1,934	122,101	1,538	87,974
Horizontal Lathes, NC, 25-50 HP	1,307	120,302	706	65,599
Horizontal Lathes, NC, Over 50 HP	267	35,554	246	40,480
Horizontal Engine & Toolroom Lathes, non-NC	7,786	74,248	5,904	60,437
Automatic Chucking Lathes, Single Spindle, non-NC	166	5,773	92	1,821
Automatic Chucking Lathes, Multi-Spindle, non-NC	129	7,791	106	4,868
Automatic Bar Machines, Single Spindle, non-NC	325	8,290	148	5,552
Automatic Bar Machines, Multi-Spindle, non-NC	120	11,141	51	3,112
Horizontal Lathes, non-NC, N.E.C.	1,026	27,637	692	16,753
Vertical Lathes, excl. VTL's, NC	270	26,398	271	24,914
Vertical Lathes, excl. VTL's, non-NC	2,115	40,523	1,387	27,081
Gear Tooth Grinding & Finishing Machines	123	11,822	134	9,471
Tool & Cutter Grinding Machines, NC	134	9,029	92	5,492
Tool & Cutter Grinding Machines, non-NC	1,236	18,167	896	17,233
Honing & Lapping Machines	180	9,476	218	5,799
Grinding Machines, Flat Surface, NC	42	4,272	35	6,367
Grinding Machines, Flat Surface Reciprocating Table, non-NC	598	11,596	605	10,512
Grinding Machines, Flat Surface, non-NC, N.E.C.	1,289	25,570	1,203	21,013
Grinding & Polishing Machines, NC, N.E.C.	33	3,324	49	6,233
External Grinding Machines, non-NC	619	25,882	350	12,176
Internal Grinding Machines, non-NC	114	4,877	169	5,806
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	201	7,109	169	5,692
Grinding Machines, non-NC, N.E.C.	888	17,853	744	21,231
Traveling Wire Electrical Discharge Machines	418	18,104	257	13,822
All Other Electrical Discharge Machines	147	7,567	133	7,666
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	130	5,116	58	4,484
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	104	5,313	91	3,516

Footnotes at end of Table.

(Continued)

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1981 and 1982

(Value in Thousands of Dollars)

(Continued)

Machine Classification	1981		1982	
	Units	Value	Units	Value
Metal Cutting Machine Tools, NC, N.E.C.	30	$ 2,437	47	$ 9,784
Sawing & Cut-off Machines, non-NC	1,232	13,235	1,044	14,173
Broaching Machines, non-NC	54	4,437	72	6,360
Metal Cutting Machine Tools, non-NC, N.E.C.	749	22,379	633	31,394
Metal Cutting Machine Tools, Less Than $2,500	893,490	70,886	1,160,183	68,870
Metal Cutting Machine Tools, Used or Rebuilt	5,007	45,922	11,676	31,672
Parts	—	193,627	—	200,711

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146".

U.S. IMPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1981 and 1982

(Value in Thousands of Dollars)

Machine Classification	1981		1982	
	Units	Value	Units	Value
GRAND TOTAL	24,213	$227,752(a)	32,550	$231,340(a)
Complete New Machines	23,429	185,901	32,064	192,039
Die Casting Machines	150	4,179	128	5,105
Punching & Shearing Machines, incl. Combination, NC	254	29,835	211	25,549
Shearing Machines, non-NC	720	11,513	597	8,025
Punching & Combination Punching & Shearing Machines, non-NC	669	9,646	704	7,993
Bending, Folding, Straightening & Flattening Machines, NC	40	2,648	58	3,491
Press Brakes, non-NC	432	7,066	341	6,328
Bending Rolls, Ram & Press Bending Machines, non-NC	213	5,085	152	3,995
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	912	15,282	810	17,927
Metal Forming Machine Tools, NC, N.E.C.	17	1,930	11	13,227
Mechanical Presses, non-NC	168	16,164	163	19,975
Hydraulic Presses, Vertical, Single Action, non-NC	79	4,027	98	3,289
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	362	24,140	265	17,085
Headers & Upsetters, non-NC	159	13,941	130	11,589
Forging Machines, non-NC, N.E.C.	37	1,812	77	9,957
Metal Forming Machine Tools, non-NC, N.E.C.	938	34,077	869	33,875
Metal Forming Machine Tools, Less Than $2,500	18,279	4,514	27,430	4,591
Metal Forming Machine Tools, Used or Rebuilt	784	5,524	466	3,918
Parts	—	36,327	—	35,383

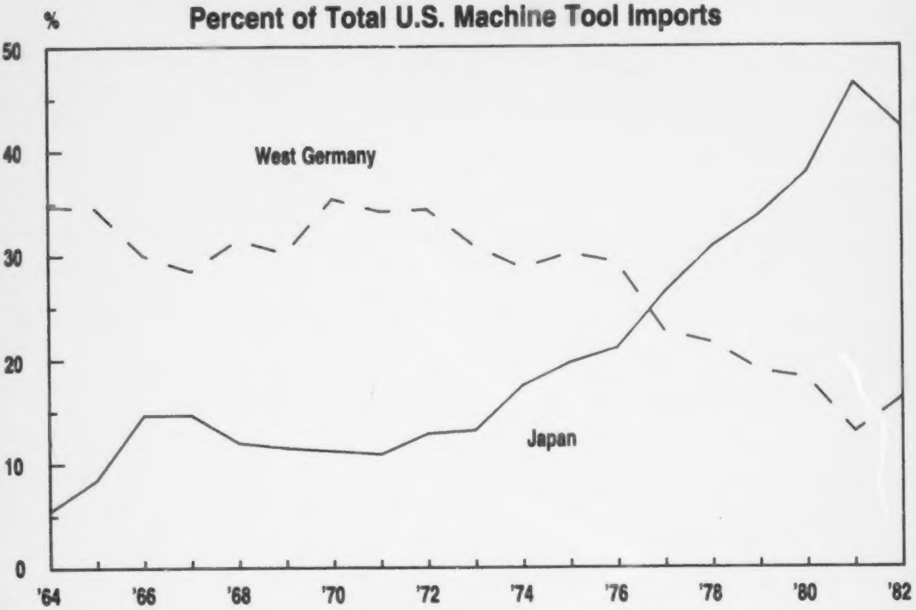
N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146".

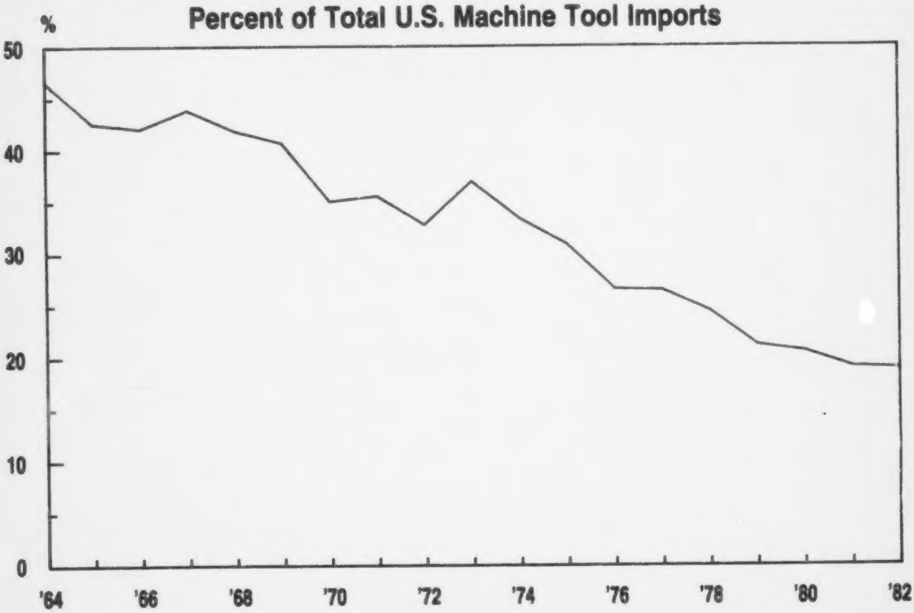
U.S. Machine Tool Imports From West Germany and Japan

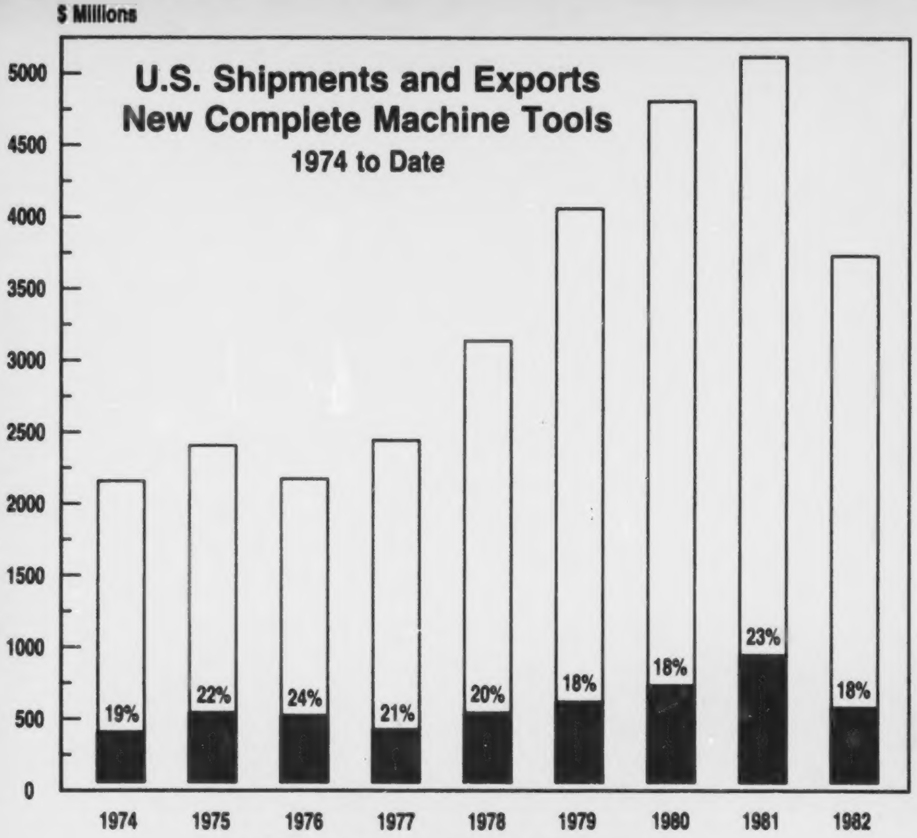
Percent of Total U.S. Machine Tool Imports



U.S. Machine Tool Imports From The United Kingdom, Italy, France, & Switzerland

Percent of Total U.S. Machine Tool Imports



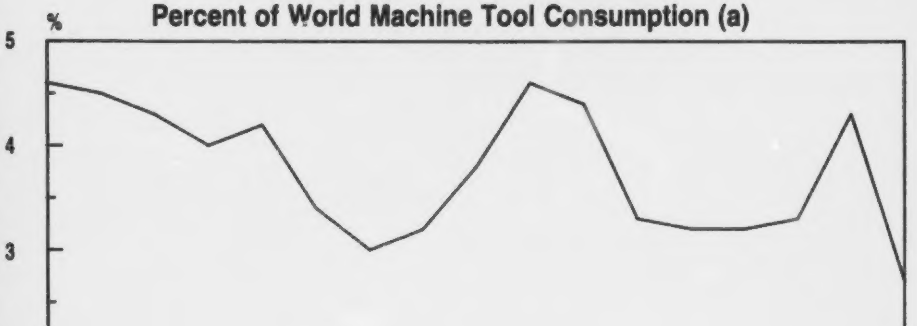


U.S. Shipments and Exports New Complete Machine Tools

1974 to Date

U.S. Machine Tool Exports

Percent of World Machine Tool Consumption (a)



(a) Excludes U.S. consumption domestically produced machine tools.

Source: American Machinist, U.S. Department of Commerce and NMTBA.

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1971 to Date

(Millions of Dollars)

Destination	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
GRAND TOTAL	$267.6	$260.0	$350.5	$443.8	$567.6	$546.5	$452.1	$560.2	$648.8	$785.3	$1,027.6	$615.0
EUROPE	105.4	96.2	131.0	192.2	242.2	194.1	163.8	201.3	212.3	228.0	231.8	163.6
Austria	1.1	1.0	.8	2.0	.5	1.5	1.8	.3	.9	1.8	1.3	1.2
Belgium	3.7	3.1	5.7	7.8	9.8	5.0	7.8	8.7	4.1	3.6	4.9	2.9
Denmark	.9	.7	.9	1.1	1.2	2.1	2.5	1.7	3.1	3.1	1.3	1.4
Finland	.9	.6	.2	1.1	1.0	2.0	.9	.6	1.9	1.5	1.8	6.3
France	14.9	12.2	16.4	11.9	15.9	18.9	10.8	12.2	20.4	21.3	29.2	19.2
Germany, West	14.9	10.4	12.2	16.9	13.8	16.0	23.7	29.7	28.5	33.7	35.2	21.8
Greece	.3	.2	.5	.9	1.7	1.1	.5	1.2	4.5	1.1	1.4	1.6
Ireland	1.0	1.0	1.3	1.0	2.1	1.5	1.0	2.0	2.9	3.5	11.4	4.2
Italy	21.4	13.1	12.8	22.9	11.6	13.8	13.5	11.0	17.5	13.4	16.7	14.9
Netherlands	3.0	3.8	4	5.2	4.3	3.6	4.5	4.8	5.3	7.8	7.4	3.3
Norway	.2	.3	.4	.3	2.9	1.7	4.1	1.5	2.3	1.9	1.0	.6
Poland	.1	1.2	2.7	3.2	7.9	13.5	8.2	24.2	3.1	2.1	(a)	.3
Portugal	.2	.5	.9	.6	.3	.7	.2	.3	.4	.4	2.1	.1
Romania	(a)	.6	.5	.4	1.9	1.6	4.8	21.0	6.6	3.3	1.5	3.3
Spain	3.4	4.9	10.9	6.1	28.2	5.8	4.3	3.7	4.6	13.5	14.2	6.3
Sweden	5.0	3.6	4.7	9.9	9.1	13.2	10.2	6.7	4.0	11.0	5.5	5.0
Switzerland	1.5	1.8	2.3	4.1	4.1	2.8	3.2	4.3	6.2	12.5	9.2	7.1
United Kingdom	17.7	16.6	19.7	27.7	34.8	38.3	26.6	46.4	83.7	62.9	64.1	59.8
U.S.S.R.	13.6	19.9	30.5	68.1	89.1	48.1	31.4	16.7	7.3	25.8	16.5	1.3
Yugoslavia	1.2	.5	3.2	.9	1.5	2.2	1.6	3.6	3.6	2.1	4.8	1.1
All Other	.1	.1	.3	.2	.5	.2	1.7	.4	1.4	1.7	2.3	1.8
NORTH AND CENTRAL AMERICA	54.4	63.8	82.5	103.9	123.7	136.7	109.4	119.8	167.9	304.4	520.5	221.6
Canada	33.7	43.2	57.3	65.0	76.7	78.9	61.1	76.5	95.4	162.4	256.1	82.3
Mexico	19.2	17.8	22.5	34.9	40.3	52.9	42.0	36.9	67.7	135.7	258.9	135.9
All Other	1.4	2.0	2.3	3.0	5.1	4.1	5.1	5.4	4.8	6.3	5.5	3.3
SOUTH AMERICA	25.8	38.1	58.4	50.5	77.9	116.6	73.8	75.3	89.5	64.5	62.1	51.5
Argentina	4.3	4.1	4.2	3.2	4.0	4.3	3.2	10.8	8.0	13.8	7.7	8.2
Brazil	13.3	25.8	43.6	38.2	55.4	86.5	40.5	31.2	23.8	19.2	24.2	21.0
Chile	.4	.2	.1	.6	.6	1.3	1.1	1.2	2.3	2.3	2.2	2.0
Colombia	1.5	1.4	1.4	.8	2.2	1.3	4.8	3.1	4.1	5.6	4.6	3.4
Ecuador	.2	.1	.3	.6	.9	1.5	2.4	2.5	4.0	1.6	3.9	1.3
Peru	.6	.6	1.4	.7	2.0	2.1	1.0	.3	1.7	2.2	3.5	9
Venezuela	5.2	5.8	7.0	5.9	12.4	19.2	20.2	25.5	45.2	18.9	15.1	14.3
All Other	.2	.2	.4	.5	.4	.4	.6	.7	.4	.9	.9	.3

(Continued)

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming By Destination, 1971 to Date

(Millions of Dollars)

(Continued)

Destination	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
ASIA	$70.2	$ 51.8	$67.0	$74.7	$89.8	$79.2	$87.5	$139.3	$151.9	$158.8	$163.6	$141.5
Hong Kong	.2	.5	.6	.4	.6	.7	1.2	2.3	1.6	4.0	10.2	2.5
India	5.0	2.4	2.3	1.9	3.0	2.5	4.2	6.9	4.4	9.7	15.2	15.4
Iran	.4	.8	1.1	1.2	6.3	12.1	9.7	21.0	1.9	0	(a)	1.0
Israel	4.2	1.9	2.7	3.6	5.8	3.9	3.9	4.1	10.9	12.4	7.7	6.8
Japan	50.1	31.3	40.2	49.1	38.5	27.0	22.1	39.0	48.3	59.1	54.2	51.0
Korea, Republic of	2.0	5.0	8.8	3.6	5.0	5.1	6.8	24.0	34.1	24.3	15.0	11.2
Philippines	.9	.7	.6	3.9	6.4	1.8	1.5	1.4	2.6	3.3	3.2	5.2
Singapore	2.1	2.1	2.0	1.9	2.9	3.1	3.9	5.5	6.3	5.5	13.7	14.7
Taiwan	1.8	1.9	4.3	3.7	7.6	9.1	17.1	9.6	10.1	15.3	16.2	8.1
Turkey	.9	1.5	.7	1.0	2.7	1.0	.6	4.8	1.5	.4	1.4	1.2
All Other	2.6	3.7	3.8	4.4	11.0	12.9	16.5	20.6	30.2	24.8	26.8	24.5
OCEANIA	6.7	5.2	8.1	12.9	21.5	8.3	7.8	13.7	17.0	12.2	22.7	12.7
Australia	6.3	4.8	7.7	12.1	21.0	7.4	6.6	12.8	15.4	10.7	21.6	11.1
New Zealand	.4	.4	.5	.9	.5	.8	1.1	.8	1.6	1.4	.7	1.4
All Other	.1	(a)	(a)	(a)	(a)	.1	.1	.1	(a)	.1	.4	.1
AFRICA	5.0	4.9	3.6	9.5	12.4	11.6	9.8	10.6	10.2	17.3	26.9	24.0
Egypt	(a)	(a)	(a)	(a)	.1	.4	1.2	1.1	.9	2.5	6.3	3.9
South Africa	3.4	3.1	2.7	7.5	9.1	7.7	4.9	6.4	5.6	11.8	16.9	10.5
All Other	1.6	1.8	.9	2.0	3.2	3.5	3.7	3.2	3.7	3.0	3.7	9.6

(a) Less than $50,000 and/or included in "All Other".

Note: Individual items may not add to totals due to rounding. These figures represent exports of domestic merchandise; value at U.S. port. The figures are lower than those for total exports because they include used machines but exclude parts. They are higher than manufacturers' export shipments because the latter are priced f.o.b. factory and exclude export shipments made by other than manufacturers.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1971 to Date
(Millions of Dollars)

Destination	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
GRAND TOTAL	$162.9	$148.3	$205.5	$264.3	$343.1	$289.8	$257.7	$366.5	$408.0	$495.4	$724.0	$403.5
EUROPE	75.0	63.3	80.6	121.7	161.6	115.4	103.7	143.7	144.7	150.0	153.6	112.1
Austria	1.0	.5	.6	1.3	.2	1.2	1.3	.2	.8	1.4	1.2	1.0
Belgium	2.7	1.4	4.1	5.1	5.3	2.8	5.5	5.5	2.2	.8	1.6	2.1
Denmark	.3	.3	.5	.4	.6	1.9	1.8	.9	1.3	1.3	.5	.8
Finland	.8	.5	.1	.8	.5	1.3	.1	.6	1.8	1.4	1.3	2.4
France	10.6	7.8	10.0	5.9	8.5	11.7	5.0	7.5	11.1	10.6	19.1	13.9
Germany, West	8.9	5.3	5.9	9.9	8.3	8.8	13.2	18.1	17.3	22.8	27.3	16.5
Greece	.2	.1	(a)	.2	.2	.6	.2	.9	1.4	.6	.3	.7
Ireland	.4	.7	.4	.3	.3	.7	.2	1.4	1.1	2.5	3.0	1.9
Italy	14.9	8.3	6.0	16.5	8.9	5.8	9.1	6.6	11.1	9.7	10.1	6.5
Netherlands	1.6	1.8	1.5	1.8	1.9	1.0	2.5	2.9	3.9	5.0	1.5	1.3
Norway	.1	.1	.4	.2	2.2	1.5	3.9	1.0	1.8	.9	.7	.4
Poland	.1	1.2	2.3	2.9	4.4	4.5	3.9	19.4	2.7	2.1	(a)	.2
Portugal	.1	.3	.1	.3	.1	.1	.1	.2	.2	.3	1.6	.1
Romania	(a)	.6	.1	.1	.3	1.4	4.8	20.9	1.3	2.3	1.4	1.2
Spain	2.5	2.9	6.1	2.5	19.1	3.6	2.6	2.0	3.3	3.1	8.2	4.0
Sweden	4.6	3.2	3.0	7.9	7.6	11.6	9.1	5.7	3.2	7.5	3.5	2.2
Switzerland	1.2	1.5	2.0	3.1	3.2	2.3	2.4	3.7	5.3	8.9	7.8	5.4
United Kingdom	11.2	8.7	9.4	17.0	21.0	21.6	13.3	27.2	67.4	42.8	46.7	49.3
U.S.S.R.	12.8	17.7	26.2	44.8	67.6	31.8	23.0	15.5	4.6	23.6	15.1	1.2
Yugoslavia	.9	.3	1.7	.5	1.1	.8	.7	3.4	2.4	1.1	1.8	.5
All Other	.1	0	.2	.1	.3	(a)	.6	.3	.4	1.3	.9	.4
NORTH AND CENTRAL AMERICA	28.7	32.1	45.4	57.4	69.0	74.6	60.6	71.1	108.1	205.1	401.8	137.5
Canada	18.4	22.5	31.4	35.8	45.0	39.6	34.7	44.7	60.4	116.2	208.0	57.6
Mexico	9.6	8.5	12.7	19.5	21.3	33.4	23.5	23.0	44.8	86.2	190.8	78.0
All Other	.6	.9	1.1	1.5	2.2	1.5	2.1	2.8	2.9	2.7	3.0	1.9
SOUTH AMERICA	12.6	19.7	38.4	29.3	38.2	47.1	41.9	44.1	37.9	33.0	33.2	33.8
Argentina	2.3	1.5	1.7	2.4	2.6	2.1	2.0	6.6	3.7	6.5	4.3	6.0
Brazil	6.6	15.6	33.4	23.9	29.9	34.9	28.0	25.5	18.5	14.6	14.7	16.2
Chile	.2	.1	.1	.2	.4	1.0	.6	.4	.6	.9	1.3	.6
Colombia	.6	.4	.4	.2	1.0	.3	1.4	1.3	1.4	3.2	2.1	2.5
Ecuador	(a)	(a)	.1	.2	.4	.9	.6	1.3	1.3	.7	1.7	.5
Peru	.3	.4	.3	.3	.6	.5	.4	.2	.5	.6	.6	.8
Venezuela	2.5	1.7	2.2	2.0	3.2	7.2	8.6	8.6	11.5	5.9	7.9	7.0
All Other	.1	.1	.2	.1	.1	.2	.3	.3	.3	.6	.6	.1

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1971 to Date

(Millions of Dollars)

(Continued)

Destination	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
ASIA	$40.1	$28.0	$35.2	$43.6	$51.5	$42.1	$43.0	$96.5	$100.6	$90.8	$105.9	$100.4
Hong Kong	.2	.2	.5	.3	.3	.5	.5	1.8	1.3	.9	1.8	1.5
India	2.7	2.1	1.8	1.2	2.0	1.9	2.3	4.1	3.4	7.0	10.4	11.7
Iran	.1	.4	.7	.5	1.8	1.8	3.3	7.2	.3	0	(a)	.6
Israel	3.3	1.2	1.1	2.1	3.7	2.5	3.1	3.0	6.3	4.3	5.3	4.0
Japan	27.5	17.2	24.4	29.6	23.6	15.6	12.1	30.9	31.1	38.6	40.8	36.6
Korea, Rep. of	1.6	1.3	1.2	1.7	1.8	4.3	5.6	22.1	24.2	16.4	12.7	9.0
Philippines	.3	.4	.2	3.2	5.0	1.1	.5	1.0	1.6	1.6	1.9	4.0
Singapore	1.2	1.1	1.3	.8	2.0	1.5	2.2	4.6	5.2	3.8	10.4	11.6
Taiwan	1.1	1.2	1.7	2.2	4.2	4.9	5.0	6.1	6.9	6.5	6.5	7.3
Turkey	.6	.5	.4	.3	1.4	.5	.5	4.5	1.5	.3	.9	.7
All Other	1.4	1.8	1.9	1.6	5.6	7.5	7.9	11.2	18.7	11.4	15.2	13.6
OCEANIA	3.7	2.5	4.5	7.0	15.4	4.8	3.7	6.3	9.8	5.5	15.9	6.7
Australia	3.5	2.3	4.3	6.7	15.2	4.2	3.2	5.8	8.6	4.9	15.3	6.1
New Zealand	.1	.2	.1	.3	.2	.6	.5	.4	1.2	.5	.3	.6
All Other	.1	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	.3	.1
AFRICA	2.8	2.7	1.5	5.4	7.4	5.8	4.8	4.8	6.9	10.8	13.5	12.8
Egypt	(a)	(a)	(a)	(a)	.1	.2	.6	.4	.7	1.8	3.2	2.4
Rep. of South Africa	1.7	1.2	1.0	4.5	5.6	3.8	3.1	3.4	4.7	7.8	8.5	7.8
All Other	1.1	1.5	.5	.2	1.8	1.8	1.1	.9	1.5	1.2	1.8	2.6

(a) Less than $50,000 and/or included in "All Other".

Note: Individual items may not add to totals due to rounding. Figures include used machine tools but exclude parts.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1971 to Date

(Millions of Dollars)

Destination	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
GRAND TOTAL	$104.7	$111.7	$145.1	$179.5	$224.5	$256.7	$194.4	$193.7	$240.8	$290.0	$303.6	$211.5
EUROPE	30.4	32.9	50.3	70.6	80.7	78.7	60.1	57.7	67.6	78.1	78.2	51.4
Austria	.1	.4	.2	.6	.4	.3	.5	.1	.1	.4	.1	.2
Belgium	1.0	1.7	1.6	2.7	4.5	2.2	2.3	3.2	1.8	2.9	3.2	.8
Denmark	.7	.4	.5	.7	.6	.2	.7	.8	1.8	1.7	.8	.6
Finland	.1	.1	.1	.3	.5	.8	.7	(a)	.1	.1	.5	3.9
France	4.3	4.5	6.4	6.0	7.4	7.2	5.8	4.7	9.3	10.6	10.0	5.3
Germany, West	6.0	5.1	6.3	7.0	5.5	7.2	10.5	11.6	11.1	10.9	7.9	5.3
Greece	.1	.1	.4	.7	1.5	.5	.4	.3	3.1	.6	1.1	.9
Ireland	.6	.3	.9	.7	1.8	.7	.8	.6	1.8	1.1	8.5	2.3
Italy	6.5	4.8	6.8	6.4	2.7	8.0	4.4	4.4	6.4	3.7	6.7	8.5
Netherlands	1.3	2.0	2.6	3.4	2.5	2.6	1.9	1.9	1.5	2.8	5.9	2.0
Norway	.2	.2	(a)	.1	.6	.2	.3	.5	.5	1.0	.3	.2
Poland	0	(a)	.3	.3	3.5	9.0	4.3	4.8	.4	(a)	0	(a)
Portugal	.1	.2	.8	.3	.2	.6	(a)	.2	.2	.2	.5	(a)
Romania	(a)	0	.4	.3	1.6	.2	(a)	.1	5.3	1.0	.1	2.1
Spain	.9	1.9	4.9	3.6	9.0	2.2	1.7	1.8	1.3	10.4	6.0	2.3
Sweden	.4	.4	1.6	2.0	1.5	1.5	1.1	1.1	.8	3.4	2.0	2.9
Switzerland	.3	.4	.3	1.0	.9	.5	.8	.6	.9	3.6	1.4	1.7
United Kingdom	6.5	7.9	10.2	10.7	13.8	16.7	13.4	19.2	16.3	20.2	17.3	10.5
U.S.S.R.	.8	2.2	4.4	23.3	21.4	16.3	8.4	1.2	2.7	2.2	1.4	.1
Yugoslavia	.3	.2	1.5	.4	.4	1.5	.9	.1	1.3	1.0	3.1	.6
All Other	(a)	.2	.1	0	.2	.2	1.1	.3	1.0	.1	1.4	1.5
NORTH AND CENTRAL AMERICA	25.7	31.7	37.1	46.6	54.7	62.1	48.8	48.7	59.8	99.4	118.8	84.1
Canada	15.2	20.7	26.0	29.2	31.6	39.3	26.4	31.8	34.9	46.2	48.2	24.7
Mexico	9.6	9.3	9.8	15.4	19.1	19.5	18.5	13.9	22.9	49.5	68.1	57.9
All Other	.8	1.1	1.2	1.5	2.9	2.6	3.0	2.6	2.0	3.7	2.5	1.5
SOUTH AMERICA	13.2	18.3	20.0	21.1	39.7	69.5	31.9	31.2	51.7	31.6	28.8	17.7
Argentina	2.0	2.5	2.5	.8	1.4	2.2	1.2	4.3	4.3	7.3	3.4	2.2
Brazil	6.6	10.2	10.2	14.3	25.4	51.6	12.5	5.7	5.3	4.7	9.5	4.8
Chile	.3	.2	(a)	.4	.2	.3	.5	.8	1.7	1.4	.9	1.4
Colombia	1.0	.9	1.0	.6	1.2	1.0	3.4	1.8	2.6	2.4	2.5	.9
Ecuador	.1	(a)	.2	.4	.5	.6	1.9	1.2	2.6	.9	2.2	.8
Peru	.3	.2	1.0	.4	1.5	1.6	.6	.1	1.2	1.6	2.9	.1
Venezuela	2.8	4.1	4.8	3.9	9.2	12.0	11.6	16.9	33.7	13.0	7.2	7.3
All Other	.2	.1	.2	.3	.3	.2	.2	.4	.3	.3	.2	.2

(Continued)

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1971 to Date

(Millions of Dollars)

(Continued)

Destination	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
ASIA	$30.2	$23.7	$31.9	$3.1	$38.3	$37.0	$44.5	$42.8	$51.2	$67.9	$57.7	$41.1
Hong Kong	.1	.3	.1	.2	.2	.2	.7	.5	.3	3.0	8.4	1.0
India	2.2	.3	.5	.7	.9	.5	1.9	2.8	1.0	2.7	4.8	3.7
Iran	.3	.4	.4	.7	4.5	10.3	6.4	13.7	1.6	0	(a)	.4
Israel	.9	.7	1.5	1.5	2.0	1.4	.7	1.1	4.6	8.1	2.4	2.8
Japan	22.6	13.6	15.8	19.5	15.0	11.4	9.9	8.1	17.1	20.5	13.4	14.4
Korea, Rep. of	.4	3.7	7.6	1.9	3.2	.8	1.3	2.0	9.9	7.9	2.3	2.3
Philippines	.6	.3	.5	.7	1.4	.7	1.0	.4	1.0	1.7	1.3	1.2
Singapore	.9	1.0	.7	1.1	.9	1.6	1.7	.8	1.1	1.6	3.3	3.1
Taiwan	.7	.7	2.6	1.4	3.4	4.2	12.1	3.5	3.2	8.8	9.7	.8
Turkey	.3	.9	.2	.7	1.3	.5	.1	.4	(a)	.1	.5	.5
All Other	1.5	1.8	2.0	2.6	13.2	5.4	8.7	9.4	11.4	13.5	11.6	10.9
OCEANIA	3.0	2.7	3.6	5.9	6.1	3.6	4.1	7.5	7.2	6.7	6.7	5.9
Australia	2.8	2.6	3.3	5.4	5.7	3.3	3.4	7.1	6.8	5.8	6.2	5.0
New Zealand	.3	.2	.3	.5	.4	.2	.5	.3	.4	.8	.4	.9
All Other	(a)	(a)	(a)	(a)	(a)	.1	.1	.1	(a)	(a)	.1	.1
AFRICA	2.2	2.3	2.1	4.2	5.0	5.8	5.0	5.8	3.3	6.3	13.4	11.2
Egypt	(a)	(a)	(a)	(a)	.1	.2	.6	.6	.2	.8	3.1	1.5
Rep.of South Africa	1.7	1.9	1.7	3.0	3.5	3.9	1.8	2.9	.9	4.0	8.3	2.7
All Other	.5	.3	.4	1.2	1.4	1.7	2.6	2.3	2.2	1.6	2.0	7.0

(a) Less than $50,000 and/or included in "All Other".

Note: Individual items may not add to totals due to rounding. Figures include used machine tools for all years but exclude parts.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1971 to 1980
(Millions of Dollars)

Machine Classification	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
GRAND TOTAL	$210.2	$186.7	$248.8	$320.7	$417.2	$362.7	$321.4	$453.7	$544.9	$674.6
Complete New Machines	153.9	137.4	194.6	245.5	327.9	273.8	247.2	353.0	392.5	462.8
Machining Centers, N.C.										
Vertical, A.T.C.	(b)	(b)	(b)	18.4	27.4	35.5	35.9	13.1	14.1	9.3
Horizontal, A.T.C.								18.2	28.5	24.3
Manual Tool Change								2.2	2.8	23.2
Vertical Boring-Drilling-Milling	(b)	(b)	(b)	(b)	(b)	(b)	(b)	.9	.9	8.2
Horizontal Boring-Drilling-Milling	5.2	5.1	5.8	8.5	8.4	5.8	11.4	9.1	14.4	5.8
Vertical Boring and Turning Mills (incl. Vertical Turret Lathes)	2.4	2.7	2.5	3.3	7.7	8.1	6.6	6.6	10.6	13.6
Boring-Drilling-Milling, N.E.C.	4.0	3.5	1.9	2.4	3.7	2.4	2.2	5.0	6.5	5.5
Drilling, Vertical (Upright)	2.7	2.4	2.4	2.8	6.4	4.9	4.6	2.5	2.0	1.4
Multiple Spindle	3.0	2.7	2.4	1.7	1.8	1.3	1.6	3.3	3.6	11.5
Radial	.8	.3	.5	.9	.9	1.6	1.1	1.6	1.3	1.9
Other	2.0	4.1	7.3	7.5	4.7	5.8	7.4	6.4	9.9	7.5
Gear Hobbers and Shapers (c)	.9	1.3	.7	.8	1.8	1.6	.4	1.3	2.1	8.8
Gear Tooth Grinding & Finishing	6.1	4.7	8.0	6.5	5.9	7.9	3.8	12.8	4.4	14.0
Other Gear Cutting	22.9	24.0	18.9	21.9	23.7	16.2	23.9	32.9	37.3	36.4
External Cylindrical Grinding	4.8	4.9	8.4	10.8	9.6	11.1	3.7	34.0	13.2	9.3
Surface Grinding	6.7	4.4	7.0	6.8	8.6	10.8	8.3	8.8	11.4	16.8
Tool and Cutter Grinding	5.7	6.9	7.4	7.5	7.9	7.1	7.3	6.8	5.7	9.2
Polishing and Buffing	.9	1.0	2.6	1.7	1.3	1.0	.9	2.7	2.9	5.2
Honing and Lapping	3.0	2.6	5.1	3.4	4.1	7.0	3.3	4.3	3.8	3.9
Internal Cylindrical Grinding	8.8	3.0	6.5	9.6	6.3	6.9	3.7	4.9	5.9	7.8
Other Grinding and Polishing (d)	7.6	7.4	13.5	13.3	15.2	13.4	12.9	19.3	23.1	32.7
Engine Lathes	3.3	3.1	5.2	3.8	6.8	6.1	4.3	8.3	6.1	3.0
Turret Lathes (Excl. Vertical)	2.5	2.0	2.3	4.5	4.6	9.4	6.7	7.1	7.0	(g)
Automatic Chucking Lathes										
Single Spindle	3.4	2.2	3.8	2.6	9.9	7.6	4.2	7.7	12.4	5.6
Multiple Spindle	5.4	1.7	1.8	5.3	2.8	2.8	4.6	3.4	4.9	3.6
Automatic Screw Machines	7.3	5.1	3.9	6.0	7.4	6.2	5.7	5.2	6.3	9.8
Other Lathes	4.9	7.0	7.3	8.6	12.1	15.3	16.8	11.9	16.3	45.1
Milling Machines										
Knee Type	1.9	3.0	3.1	4.6	4.7	3.2	4.5	4.0	3.4	1.1
Bed Type	2.5	1.7	.5	1.6	1.8	1.7	2.9	11.9	2.8	2.8
Profile, Dup. & Die Sinking	3.4	3.8	2.3	2.9	2.9	3.4	1.0	5.5	4.9	2.9
Other	9.9	5.1	8.1	5.7	11.2	6.0	12.9	9.1	12.3	12.4
Broaching	3.3	1.3	2.5	3.2	5.5	1.8	3.4	11.6	2.4	6.9
Planers, Other than Gear	.3	.3	.4	.3	.5	.6	.7	1.5	1.6	(b)
Shapers and Slotters	.8	.6	.3	1.3	.5	1.0	.6			
Sawing and Cutoff	4.3	3.9	5.1	6.1	9.0	8.5	7.0	13.5	12.5	12.2
Tapping	.8	1.0	1.3	1.0	1.4	3.4	1.6	1.9	1.9	(b)
Threading	2.0	2.7	4.0	4.9	3.0	2.5	4.5	4.2	9.9	(b)
Electrical Discharge	(b)	(b)	(b)	(b)	(b)	(b)	(b)	3.4	5.2	10.2
Single Station (Way Type)								.3	.4	51.7
Multi-Station	5.0	6.4	30.9	39.2	72.0	25.1	7.7	16.0	42.9	
Metal Cutting Machine Tools, N.E.C.										
$2,500 and Over, New (e)	5.4	5.6	11.2	9.8	17.3	11.9	10.8	11.7	14.5	21.1
Less than $2,500, New (f)				6.5	9.0	8.9	8.3	17.9	20.5	15.9
Used and Rebuilt Machines	9.0	10.9	10.9	18.8	15.2	16.0	10.5	13.5	15.5	32.6
Parts (a)	47.3	38.4	43.3	56.4	74.1	72.9	63.7	87.3	136.9	179.2

N.E.C. - Not Elsewhere Classified.

- (a) Attachments and accessories are not included after 1971.
- (b) Included in "Metal Cutting Machine Tools, N.E.C."
- (c) "Gear Hobbers" for years prior to 1978.
- (d) "Other Grinding" for years prior to 1978 & 1979.
- (e) "$1,000 and Over" for years prior to 1978.
- (f) "Less than $1,000" for years prior to 1978.
- (g) Included in "Other Lathes."

Note: Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1971 to 1980
(Millions of Dollars)

Machine Classification	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
GRAND TOTAL	$140.3	$145.4	$194.3	$245.7	$288.6	$320.0	$258.1	$284.9	$333.7	$424.6
Complete New Machines	98.0	100.6	130.9	165.1	208.7	241.1	179.5	180.1	226.6	271.4
Punching and Shearing Machines	5.6	5.9	5.0	9.4	13.8	20.2	15.4	13.7	22.3	44.8
Bending and Forming Machines	12.9	11.9	16.3	21.3	22.9	26.0	25.5	39.2	45.7	41.0
Hydraulic and Pneumatic Presses	14.4	18.1	26.1	27.5	37.5	46.8	29.1	21.5	32.6	42.0
Mechanical Presses, O.B.I.	14.9(a)	15.9(a)	15.6(a)	31.1(a)	28.5(a)	33.2(a)	17.5(a)	2.2	1.1	27.7
Other Mechanical Presses								8.6	18.1	
Headers and Upsetters	12.0	11.2	9.2	8.2	8.7	10.6	9.2	14.8	13.2	4.4
Forging Machines (except Presses)			4.5	2.7	3.8	3.0	4.2	6.2	7.0	12.0
Metal Container-making Machines	5.8	6.9	11.5	16.7	17.0	23.6	12.0	22.8	32.9	(d)
Metal Forming Machines, N.E.C.	4.3	3.8	5.6	6.1	9.3	6.5	8.1	44.7	46.5	92.4(e)
Metalworking Machines, N.E.C.	28.1	26.9	37.1	39.2	63.6	67.0	54.2			
Metal Forming Mach. Tools under $2,500 (b)	(a)	(a)	(a)	2.9	3.6	4.2	4.3	6.4	7.2	7.1
Used and Rebuilt Machines	7.0	11.0	14.1	14.5	15.8	15.6	14.9	13.6	14.2	18.6
Parts (c)	35.7	33.7	49.2	66.3	64.1	63.3	63.7	91.2	92.9	134.7

N.E.C. - Not Elsewhere Classified.

(a) Included in the respective metalforming and metalworking classifications for years prior to 1974.
(b) Under $1,000 for years prior to 1978.
(c) Chucks, chuckholders, tool holders and their parts and work holding, positioning equipment and other attachments and accessories are not included after 1971.
(d) Included in "Metal Forming Machines, N.E.C."
(e) From 1980 forward "Die Casting Machines & Parts" are included.

Sources: U.S. Bureau of the Census, "EM 522".

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1981 and 1982

(Values in Thousands of Dollars)

Machine Classification	1981		1982	
	Units	Value	Units	Value
GRAND TOTAL	77,022	$974,183(a)	52,906	$630,465(a)
Complete New Machines	72,427	668,581	49,589	375,645
Gear Hobbers and Shapers	233	22,728	37	5,323
Gear Cutting Machines, N.E.C.	357	39,308	234	22,868
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	54	5,506	33	2,931
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	24	5,888	5	3,187
Horizontal Machining Centers, ATC, NC	109	27,029	74	19,051
Machining Centers, NC, N.E.C.	129	14,998	83	8,841
Single Station and Multi-Station Transfer Machines	220	94,197	42	33,317
Way Type Machines (Unit Heads)	19	3,049	20	3,070
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	18	9,504	10	3,246
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	2	631	3	1,702
Vertical Boring-Drilling-Milling Machines, NC	48	4,908	11	2,865
Horiz. Boring-Drilling-Milling Machines, non-NC	21	2,755	18	3,977
Vertical Boring-Drilling-Milling Machines, non-NC	481	37,197	33	1,700
Drilling Machines, NC	27	4,246	12	790
Drilling Machines, Multi-Spindle, non-NC	94	7,751	49	3,620
Drilling Machines, Radial, non-NC	63	1,973	23	1,257
Drilling Machines, Upright, Single Spindle, non-NC	95	2,932	50	820
Drilling Machines, non-NC, N.E.C.	287	7,481	215	5,886
Milling Machines, NC	45	22,540	58	11,725
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	65	5,532	43	1,615
Milling Machines, Knee Type, non-NC	11	512	26	822
Milling Machines, Bed Type, non-NC	18	1,950	3	276
Milling Machines, non-NC, N.E.C.	153	7,262	201	7,912
Vertical Boring Machines, incl. VTL's, NC	23	5,319	12	2,289
Vertical Boring Machines, incl. VTL's, non-NC	118	13,396	104	12,252
Boring Machines, NC, N.E.C.	7	1,027	12	952
Boring Machines, non-NC, N.E.C.	79	4,700	100	3,401
Horizontal Lathes, NC, Less Than 25 HP	101	6,973	142	12,030
Horizontal Lathes, NC, 25-50 HP	53	9,508	54	11,068
Horizontal Lathes, NC, Over 50 HP	11	3,871	19	7,328
Horizontal Engine & Toolroom Lathes, non-NC	308	5,571	117	2,351
Automatic Chucking Lathes, Single Spindle, non-NC	47	7,453	8	2,329
Automatic Chucking Lathes, Multi-Spindle, non-NC	35	4,316	16	2,320
Automatic Bar Machines, Single Spindle, non-NC	72	3,208	28	1,058
Automatic Bar Machines, Multi-Spindle, non-NC	84	7,729	27	3,492
Horizontal Lathes, non-NC, N.E.C.	522	18,478	369	13,624
Vertical Lathes, excl. VTL's, NC	25	3,771	16	3,107
Vertical Lathes, excl. VTL's, non-NC	210	19,152	161	11,683
Grinding, Polishing, Honing & Lapping Machines, NC	115	19,466	62	11,580
Gear Tooth Grinding & Finishing Machines, non-NC	108	18,097	98	9,193
Tool & Cutter Grinding Machines, non-NC	406	9,548	215	6,484
Honing & Lapping Machines, non-NC	449	9,526	208	3,341
Grinding Machines, Flat Surface Reciprocating Table, non-NC	205	3,544	187	3,362
Grinding Machines, Flat Surface, non-NC, N.E.C.	338	22,672	202	14,045
External Grinding Machines, non-NC	110	15,894	51	7,194
Internal Grinding Machines, non-NC	36	5,093	25	4,336
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	269	11,240	170	8,099
Grinding Machines, non-NC, N.E.C.	766	29,564	757	12,704

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1981 and 1982
(Values in Thousands of Dollars)

(Continued)

Machine Classification	1981 Units	1981 Value	1982 Units	1982 Value
Traveling Wire Electrical Discharge Machines	50	$ 1,533	22	$ 292
All Other Electrical Discharge Machines	275	3,627	177	2,888
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	5	494	5	369
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	63	1,430	61	1,389
Metal Cutting Machine Tools, NC, N.E.C.	101	3,488	26	2,234
Sawing & Cut-off Machines, non-NC	755	12,608	481	8,750
Broaching Machines, non-NC	228	15,540	48	13,363
Metal Cutting Machine Tools, non-NC, N.E.C.	685	21,672	468	16,123
Metal Cutting Machine Tools, Less Than $2,500	63,195	19,049	43,858	13,718
Metal Cutting Machine Tools, Used or Rebuilt	4,595	55,424	3,317	27,899
Parts	—	250,178	—	226,921

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1981 and 1982
(Values in Thousands of Dollars)

Machine Classification	1981 Units	1981 Value	1982 Units	1982 Value
GRAND TOTAL	16,467	$471,368(a)	11,343	$371,922(a)
Complete New Machines	14,847	280,972	10,622	198,922
Die Casting Machines & Parts	—	15,204	—	10,521
Metal Forming Machine Tools, Less Than $2,500	9,717	6,140	7,336	4,168
Punching & Shearing Machines, incl. Combination, NC	118	13,756	68	8,301
Shearing Machines, non-NC	156	9,174	97	3,733
Punching & Combination Punching & Shearing Mach., non-NC	921	22,004	615	20,889
Bending, Folding, Straightening & Flattening Machines. NC	232	14,524	150	12,677
Press Brakes, non-NC	130	5,695	163	2,824
Bending Rolls, Ram & Press Bending Machines, non-NC	57	2,955	56	2,952
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	769	22,820	438	16,651
Mechanical Presses, non-NC	424	22,922	251	23,913
Hydraulic Presses, Vertical, Single Action, non-NC	116	15,008	80	7,657
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	623	41,436	355	22,263
Headers & Upsetters, non-NC	79	7,686	50	7,226
Forging Machines, non-NC, N.E.C.	177	13,636	140	8,072
Metal Forming Machine Tools, non-NC, N.E.C.	1,328	67,941	823	47,031
Metal Forming Machine Tools, Used or Rebuilt	1,620	22,596	721	12,547
Parts	—	167,800	—	160,453

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522".

U.S. FOREIGN TRADE IN MACHINE TOOLS AND PARTS

1958 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)			Imports for Consumption (Value in Foreign Country)		
Year	TOTAL	Metal Cutting	Metal Forming	TOTAL	Metal Cutting	Metal Forming
1958	$ 148.8	$100.5	$ 48.3	$ 28.1	$ 17.6	$ 10.5
1959	135.0	82.2	52.8	32.5	23.8	8.7
1960	192.5	127.8	64.7	35.7	26.3	9.4
1961	270.2	191.6	78.6	32.4	22.6	9.8
1962	303.9	205.3	98.6	37.5	28.4	9.1
1963	220.6	144.9	75.7	45.1	33.4	11.7
1964	300.8	204.8	96.0	45.6	38.1	7.5
1965	287.2	191.6	95.6	68.9	58.9	10.0
1966	273.6	176.3	97.3	137.4	121.2	16.2
1967	294.5	199.6	94.9	203.7	174.8	28.9
1968	286.0	178.2	107.8	191.3	166.1	25.2
1969	323.5	201.1	122.4	182.6	153.4	29.2
1970	403.9	268.8	135.1	158.5	126.1	32.4
1971	351.0	210.3	140.7	109.6	87.4	22.2
1972	332.1	186.7	145.4	141.8	104.2	37.6
1973	443.0	248.7	194.3	211.6	164.6	47.0
1974	566.5	320.8	245.7	330.3	261.3	69.0
1975	705.9	417.3	288.6	382.4	303.0	79.4
1976	682.7	362.7	320.0	383.3	293.6	89.7
1977	579.5	321.4	258.1	482.2	386.7	95.5
1978	738.6	453.7	284.9	832.4	681.6	150.7
1979	878.6	544.9	333.7	1,269.5	1,027.6	241.9
1980	1,099.2	674.6	424.6	1,556.9	1,282.2	274.7
1981(r)	1,445.6	974.2	471.4	1,712.9	1,485.1	227.8
1982	1,002.4	630.5	371.9	1,489.4	1,258.1	231.3

r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metalworking machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Sources: U.S. Bureau of the Census, "EM 522" and "IM 146".

The coverage of exports reported by the Bureau of the Census in its report "EM 522" is more inclusive than that reported as "manufacturers' export shipments." The data include exports by distributors and brokers, rebuilt tools, machine tools designed for workshops, garages, etc. Values include freight, insurance, and other charges from the manufacturers' plants to the point of departure in the United States. Import values exclude import duties, insurance, ocean freight and other charges incidental to the arrival of goods in the United States.

U.S. FOREIGN TRADE IN BORING MACHINES INCLUDING VERTICAL TURRET LATHES

1964 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1964	583	$23.3	283	$ 8.7	313	$ 3.8
1965	776	11.9	174	4.8	394	6.1
1966	484	12.1	183	5.3	692	12.8
1967	435	13.0	177	4.8	937	21.0
1968	363	14.4	147	4.4	1,057	19.4
1969	363	11.7	121	6.2	797	21.0
1970	503	18.6	158	8.1	2,223	22.8
1971	419	11.5	139	3.8	808	11.6
1972	392	11.2	71	3.0	1,083	13.6
1973	427	10.2	NA	3.7	825	14.4
1974	328	14.1	NA	12.0	1,726	28.8
1975	566	19.7	NA	8.1	2,521	41.1
1976	393	16.3	NA	9.8E	3,219	41.0
1977	382	20.3	NA	6.5	4,824	51.7
1978	577	21.7	NA	10.2	1,347	65.9
1979	724	32.4	NA	9.5	1,901	70.7
1980	626	33.2	NA	17.7	2,289	76.9
1981(r)	797	79.4	NA	41.5E	3,158	86.7
1982(p)	30[illegible]	32.4	NA	14.2	3,140	78.8

NA - Not Available. E - Estimate by NMTBA. p - Preliminary. r - Revised.

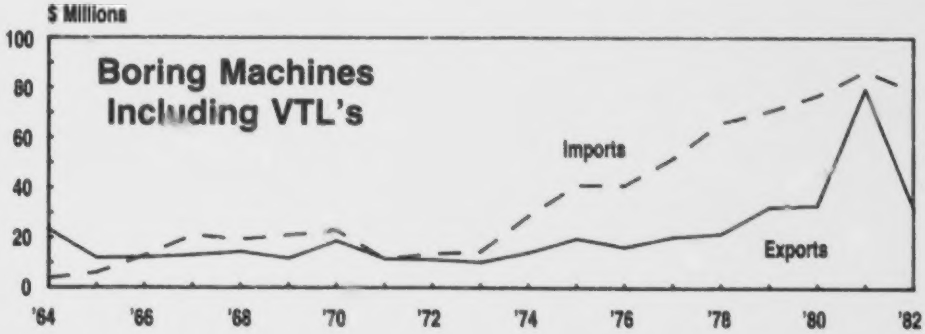
(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Manufacturers' export shipments exclude vertical turret lathes.

(c) Generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".

The user should be aware that the minimum valuation of machines included in each of the three series shown on this and following tables has changed over time. "Total Exports" included all machines, regardless of value, until 1973. From 1974 through 1977 the series included only machines above $1,000. The minimum value was increased in 1978 to $2,500. "Manufacturers' Export Shipments" include machines valued less than $1,000 for all years shown. "Imports for Consumption" included all machines regardless of value through 1977. After 1977 only machines valued over $2,500 are included.



U.S. FOREIGN TRADE IN DRILLING MACHINES

1964 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1964	5,915	$13.9	737	$7.9	1,255	$1.5
1965	7,315	8.6	612	4.2	1,864	2.3
1966	3,425	6.1	494	4.6	3,732	5.1
1967	3,427	10.9	685	7.2	5,304	7.6
1968	1,811	6.8	724	4.7	5,403	10.1
1969	2,413	9.5	1,153	5.6	6,146	6.0
1970	2,316	9.5	1,353	5.5	5,690	4.3
1971	2,173	8.5	672	5.0	4,744	2.9
1972	1,788	9.5	587	4.4	8,223	4.3
1973	2,889	12.6	NA	6.0E	8,541	.6
1974	883	12.9	NA	6.2	11,928	8.8
1975	860	13.9	NA	9.3	11,754	9.4
1976	815	13.6	NA	7.8	50,147(c)	15.3(c)
1977	782	14.6	NA	4.2	72,534(d)	19.7(d)
1978	688	13.8	NA	4.1	1,714	18.7
1979	1,762	16.8	NA	4.2	2,515	25.0
1980	546	22.2	NA	12.2	2,253	27.2
1981	566	24.4	NA	12.1	2,238	26.4
1982(p)	349	12.4	NA	13.7	1,317	20.7

NA - Not Available. E - Estimate by NMTBA. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

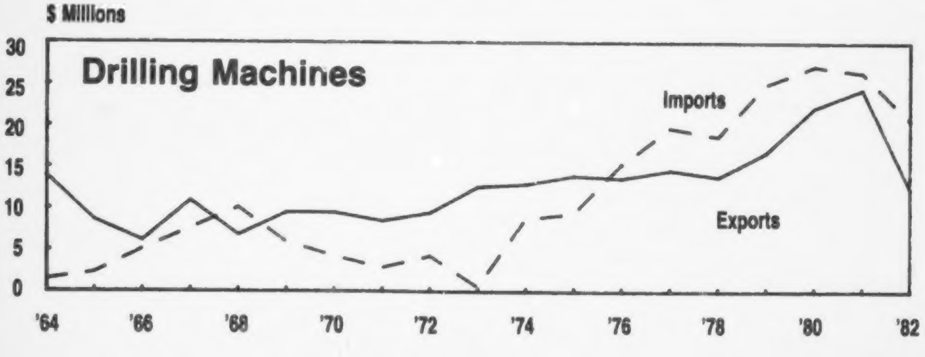
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 6,000 and dollar value about $12,000.

(d) The average unit value of imports from Norway, India, Japan and Taiwan, as reported by the U.S. Bureau of the Census, was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufactures' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN GEAR CUTTING AND FINISHING MACHINES

1964 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1964	881	$18.7	520	$17.4	160	$ 1.4
1965	681	16.1	509	18.6	227	3.3
1966	632	15.8	471	18.0	281	2.4
1967	852	23.6	692	29.4	279	3.6
1968	1,266	26.6	647	30.8	297	3.8
1969	841	24.4	615	32.2	320	2.5
1970	780	28.4	636	40.0	226	4.5
1971	1,030	30.0	588	36.4	132	3.7
1972	900	30.0	439	30.7	250	4.5
1973	718	27.5	NA	29.0E	134	4.7
1974	546	29.1	NA	40.0E	343	10.7
1975	499	31.4	NA	35.9	365	20.7
1976	552	25.7	NA	19.7E	198	16.9
1977	303	28.1	NA	D	200	13.5
1978	1,069(c)	47.0(c)	NA	D	494(d)	25.9(d)
1979	684	43.8	NA	D	466	33.1
1980	519	61.2	NA	D	415	41.3
1981	698	80.1	NA	D	367	37.0
1982(p)	369	37.4	NA	D	281	25.8

NA - Not Available. E - Estimate. D - Withheld to avoid disclosure. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

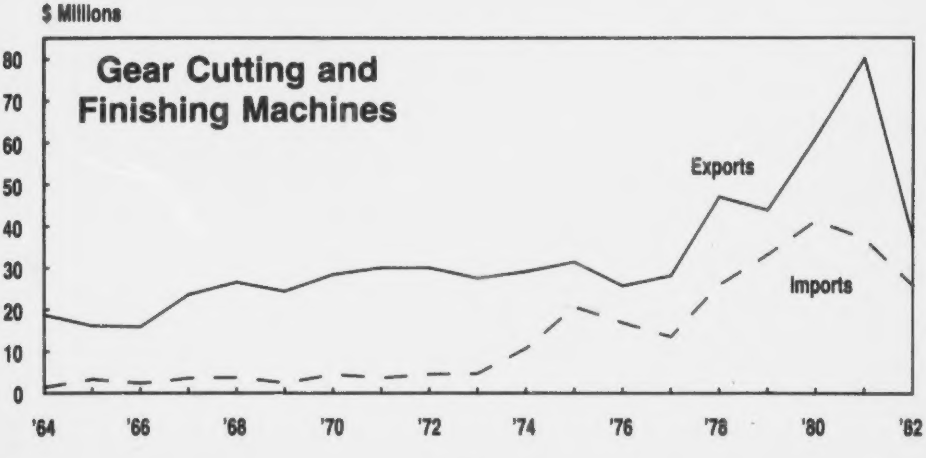
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Includes machines valued at less than $2,500.

(d) Includes used, rebuilt and machines valued less than $2,500 each.

Note: Imports exclude the value of parts. See note page 147 concerning description of categories.

Sources: Manufacturers export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN GRINDING AND POLISHING MACHINES
1964 to Date
(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1964	13,152	$ 45.2	3,730	$38.1	2,413	$ 4.9
1965	8,607	37.4	3,575	31.1	2,817	6.5
1966	7,093	34.6	4,779	30.4	4,966	12.7
1967	7,128	32.0	4,155	29.7	4,934	16.0
1968	7,679	28.9	3,354	27.7	5,792	17.0
1969	7,906	41.5	3,396	37.0	5,352	16.6
1970	9,154	48.4	4,190	47.0	5,425	15.3
1971	8,094	32.7	3,677	29.4	3,175	11.6
1972	8,900	30.2	3,591	26.8	4,791	12.7
1973	9,883	50.5	NA	39.4	3,972	20.0
1974	3,266	53.0	NA	53.5	7,500	32.4
1975	3,022	53.0	NA	49.5	5,641	34.1
1976	2,537	57.3	NA	56.3	35,411(c)	32.2(c)
1977	4,124	40.1	NA	38.3	46,573(d)	39.2(d)
1978	2,455	80.8	NA	49.8	3,261	68.1
1979	2,487	65.9	NA	42.0	4,233	80.5
1980	1,979	85.1	NA	75.4	5,698	138.6
1981(r)	2,694	126.5	NA	88.2	5,334	137.2
1982(p)	1,877	71.1	NA	67.9	4,530	117.6

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

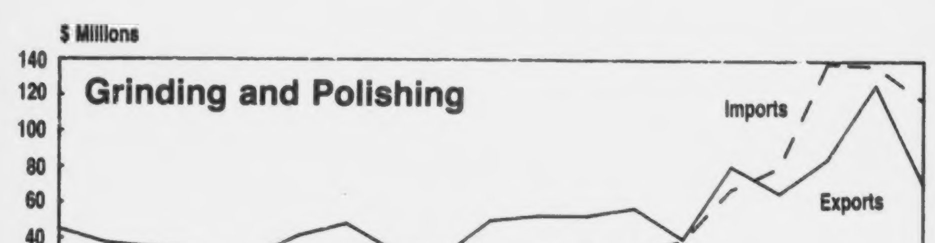
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 11,500 and the dollar value about $31,000.

(d) The average unit value of imports from Taiwan, as reported by the U.S. Bureau of the Census was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN LATHES, EXCLUDING VERTICAL TURRET LATHES

1964 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1964	3,299	$36.8	1,633	$28.2	6,083	$ 8.9
1965	4,072	23.5	1,322	20.1	8,736	14.2
1966	2,740	19.8	1,131	18.6	14,819	37.2
1967	2,611	21.6	1,083	18.7	15,654	47.7
1968	2,161	19.8	683	15.3	11,452	38.1
1969	2,213	22.2	673	16.8	13,241	38.0
1970	2,871	29.2	842	29.3	12,082	27.9
1971	2,481	26.8	774	24.0	6,252	17.8
1972	2,957	21.1	500	19.2	5,578	22.9
1973	3,124	24.3	NA	20.3E	6,058	45.7
1974	1,921	31.0	NA	31.9E	8,187	73.1
1975	2,503	43.6	NA	55.0	6,745	77.0
1976	2,153	47.4	NA	45.9	7,801	77.0
1977	1,953	42.3	NA	35.6	11,527	113.0
1978	1,434	43.7	NA	37.1	12,280	219.3
1979	1,717	53.0	NA	45.5(d)	18,332	353.6
1980	1,107	67.1	NA	50.8(d)	16,710	380.0
1981(r)	1,468	90.0	NA	58.5(d)	15,445	479.8
1982(p)	957	70.4	NA	33.6(d)	11,141	338.6

NA - Not Available. E - Estimate by NMTBA. r - Revised. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

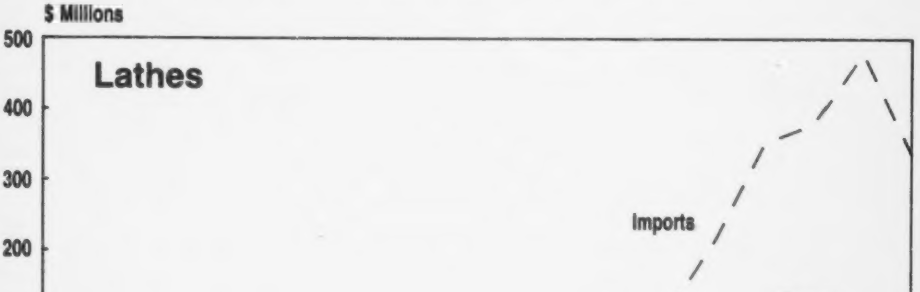
(b) Manufacturers' export shipments include vertical turret lathes.

(c) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(d) Does not include data for Vertical NC Lathes.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN MILLING MACHINES

1964 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1964	1,309	$18.1	507	$14.8	656	$ 3.3
1965	988	7.5	398	8.8	1,128	6.1
1966	1,072	8.9	338	10.2	3,405	17.4
1967	802	11.3	399	16.8	5,715	31.4
1968	848	17.9	304	12.1	5,428	30.6
1969	686	13.6	368	6.7	4,710	26.3
1970	779	19.1	456	12.2	2,047	13.4
1971	681	17.6	276	11.8	986	7.9
1972	589	13.6	416	5.3	1,441	7.5
1973	687	14.0	NA	8.0E	1,760	12.4
1974	776	14.8	NA	10.3	2,313	19.8
1975	804	20.6	NA	20.6	2,567	23.3
1976	799	14.4	NA	16.3E	2,413	25.9
1977	965	21.3	NA	D	3,720	27.9
1978	1,026	30.6	NA	D	3,364	47.7
1979	1,040	23.4	NA	20.1	6,650	83.1
1980	360	19.2	NA	27.9	11,573	138.1
1981	292	37.8	NA	33.4	10,434	124.7
1982(p)	331	22.4	NA	21.0	5,985	87.7

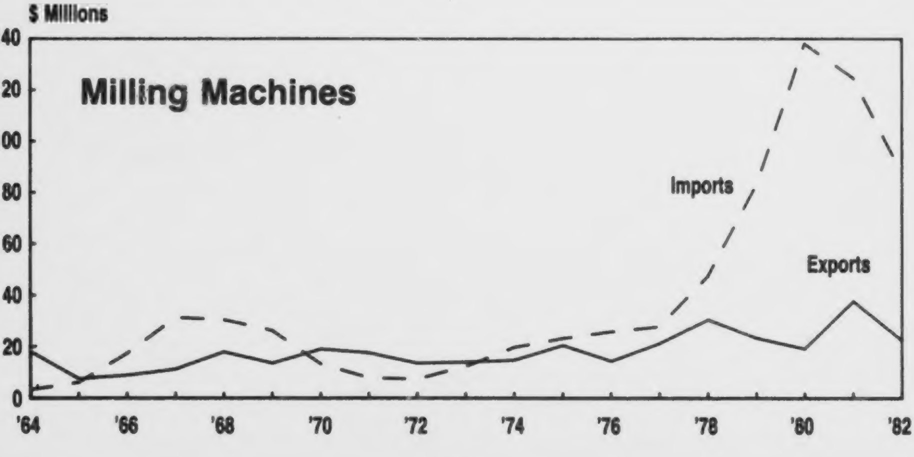
NA - Not Available. D - Withheld to avoid disclosure. E - Estimate by NMTBA. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. FOREIGN TRADE IN MACHINING CENTERS

1979 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1979(c)	259	$45.4	NA	D	552	$ 39.6
1980	313	56.7	NA	$57.9	957	93.4
1981(r)	316	53.4	NA	43.0	2,007	195.7
1982(p)	195	34.0	NA	D	1,873	188.9

NA - Not Available. D - Withheld to avoid disclosure. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Data not available prior to 1979, Machining Centers had been included in "Other" category.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; Bureau of the Census, "EM 522" and "IM 146".

U.S. FOREIGN TRADE IN "OTHER" METAL CUTTING MACHINE TOOLS (c,d)

1962 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1962	5,704	$ 32.4	2,667	$ 31.8	5,669	$ 4.4
1963	9,636	25.4	3,382	16.7	4,849	5.6
1964	8,487	34.6	3,167	36.3	5,965	6.7
1965	9,300	44.8	2,547	39.5	8,434	9.7
1966	10,692	38.5	4,029	39.5	26,340	17.1
1967	9,324	42.7	2,846	37.4	20,533	26.1
1968	11,635	22.3	2,250	26.2	13,550	23.1
1969	9,869	29.5	3,080	30.7	10,832	22.4
1970	11,777	53.0	3,464	43.7	18,509	16.4
1971	10,550	21.9	2,728	22.8	20,167	15.5
1972	9,201	21.8	3,073	23.2	20,704	17.1
1973	14,554	55.5	NA	63.8	9,251	23.3
1974	27,309	90.6	NA	78.0	26,444	35.5
1975	52,902	145.7	NA	146.7	21,266	42.5
1976	98,545	99.1	NA	90.7	42,064	37.1
1977	91,551	80.6	NA	66.4	74,175	53.3
1978	107,823	115.5	NA	92.0	465,218	136.5
1979	105,962	111.7	NA	74.0	597,946	147.5
1980	53,943	150.6	NA	173.2	582,050	169.7
1981(r)	70,191	232.1	NA	168.7	901,398	204.5
1982(p)	48,525	123.4	NA	46.5(e)	1,174,244	199.2

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) For 1978 and prior years Machining Centers were included in "Other". For 1979 Machining Centers are classified separately.

(d) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports and Imports.

(e) Does not include data for Station Type Machines.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146".

U.S. FOREIGN TRADE IN METAL FORMING MACHINES AND PARTS

1964 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)								Imports for Consumption
Year	Total	Presses	Bending and Forming	Punching and Shearing	Forging Machines	Other New (b)	Used	Parts	Customs Import Value (a)
1964	$ 96.0	$33.6	$11.4	$ 5.5	$13.4	$ 32.1*	NA	NA	$ 7.5
1965	95.6	26.1	10.1	5.6	10.7	20.2	$8.6	$14.3	10.0
1966	97.3	22.5	11.2	9.8	6.0	22.6	4.9	20.3	16.2
1967	94.9	22.5	13.6	6.4	6.6	20.5	5.0	20.3	28.9
1968	107.8	33.9	10.2	5.9	5.5	25.4	3.6	23.3	25.2
1969	122.4	28.3	14.1	9.5	6.9	31.2	4.4	28.0	29.2
1970	135.1	25.9	11.0	6.5	8.3	34.2	6.1	43.1	32.4
1971	140.3	29.0	12.9	5.6	12.0	38.2	7.0	35.7	22.2
1972	145.4	34.0	11.9	5.9	11.2	37.6	11.0	33.7	37.6
1973	194.3	41.7	16.3	5.0	13.7	54.2	14.1	49.2	47.0
1974	245.7	58.6	21.3	9.4	10.8	64.9	14.5	66.3	69.0
1975	288.6	66.0	22.9	13.8	12.5	93.5	15.8	64.1	79.4
1976	320.0	80.1	26.0	20.2	13.5	101.3	15.6	63.3	89.7
1977	258.1	46.6	25.6	15.4	13.4	78.5	14.9	63.7	95.5
1978	284.9	32.3	39.2	13.7	21.0	73.9	13.6	91.2	150.7
1979	333.7	51.8	45.7	22.3	7.0	99.8	14.2	92.9	241.9
1980	424.6	69.7	44.5	44.8	16.4	95.9	18.6	134.7	274.7
1981	471.4	79.4	46.0	44.9	21.3	89.3	22.6	167.8	227.8
1982	371.9	53.8	35.1	32.9	15.3	61.7	12.5	160.5	231.3

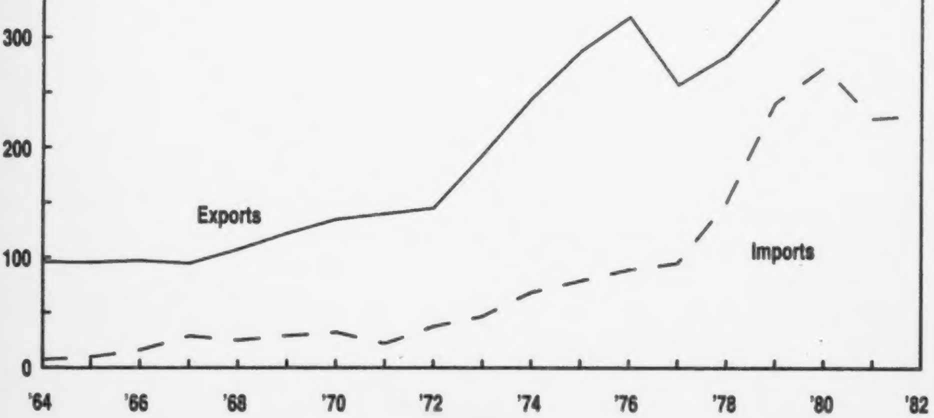
NA - Not Available.   * - Includes Parts.

(a) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(b) Beginning in 1980 "Die Casting Machines" are included.

Note: See note on page 147 concerning description of categories.

Source: U.S. Bureau of the Census, "EM 522" and "IM 146".



U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

Units and Value, 1959 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

	Total		Presses		Bending and Forming		Punching and Shearing		Forging		Other (b)	
Year	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value
1959	2,166	$ 31.3	714	$15.1	793	$ 4.1	226	$ 3.0	96	$ 5.3	337	$ 3.8
1960	2,716	47.3	893	23.3	913	5.6	307	5.1	173	9.0	430	4.2
1961	2,758	55.2	934	30.7	930	4.7	283	6.8	166	8.9	445	4.1
1962	3,026	59.6	1,032	32.7	971	5.4	322	5.5	203	10.9	498	5.1
1963	2,955	42.3	943	20.1	1,135	7.6	362	6.5	112	4.7	403	3.4
1964	3,533	47.2	1,006	21.3	1,609	7.3	314	5.0	152	8.4	452	5.2
1965	3,338	44.1	751	18.4	1,600	5.6	284	4.3	148	8.4	555	7.5
1966	3,029	46.5	840	17.9	1,421	9.4	322	3.2	103	6.6	523	9.5
1967	2,824	50.2	962	24.5	933	5.6	324	5.9	98	6.3	507	7.9
1968	3,050	46.9	872	23.7	1,382	5.7	316	4.9	111	5.4	369	7.2
1969	3,380	39.9	943	14.3	1,503	5.1	536	6.5	141	6.1	257	7.9
1970	3,574	47.0	1,047	17.4	1,539	5.5	560	5.1	161	11.2	267	7.7
1971	4,491	51.9	915	22.3	1,287	5.7	461	3.7	186	13.0	1,642	7.1
1972	3,088	50.2	838	18.8	1,382	5.8	401	3.8	152	14.5	315	7.3
1973	NA	54.5	NA	21.2	NA	6.2	NA	3.4	NA	13.2	NA	10.5
1974	NA	78.4	NA	D	NA	15.7	NA	8.3	NA	D	NA	18.6
1975	NA	98.6	NA	D	NA	14.9	NA	14.7	NA	D	NA	16.8
1976	NA	105.8	NA	D	NA	16.5	NA	17.4	NA	D	NA	16.8
1977	NA	71.7	NA	D	NA	13.5	NA	16.6	NA	D	NA	12.9
1978	NA	112.8	NA	D	NA	17.4	NA	14.7	NA	D	NA	18.7
1979	NA	112.0	NA	27.7	NA	24.5	NA	16.8	NA	D	NA	D
1980	NA	152.0	NA	35.2	NA	34.5	NA	32.6	NA	D	NA	D
1981(r)	NA	156.7	NA	43.1	NA	29.8	NA	29.5	NA	D	NA	D
1982(p)	NA	117.8	NA	36.3	NA	19.4	NA	16.2	NA	D	NA	D

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Complete new machines as shipped, including accessories, etc., ordered and shipped with the machines, f.o.b. factory.

(b) Some metalworking machines, other than metal forming type machines, are included prior to 1968.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

The export figures for machine tools shown in this table and in tables and graphs in Chapter 4 are substantially lower than those on the preceding pages. This is so for several reasons: first, the data for Manufacturers' Exports cover only new and complete machine tools; second, they represent the manufacturer's selling price at the factory (F.O.B.); third, they exclude machine tools which are sold domestically but exported later by the buyer. The two sources for the tables mentioned above, NMTBA (Chapter 4) and the "Current Industrial Reports" (above), differ although they are based on the same sources. The reasons are the extent of coverage and different reporting practices. See Chapter 4 Introduction for a detailed explanation.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF NEW MACHINE TOOLS (a)

Units and Value, 1959 to Date

(Values in Millions of Dollars)

Year	Total (b)		Metal Cutting		Metal Forming (b)	
	Units	Value	Units	Value	Units	Value
1959	9,867	$ 80.8	7,701	$ 49.5	2,168	$ 31.3
1960	13,203	157.5	10,487	110.2	2,716	47.3
1961	14,080	207.2	11,322	152.0	2,756	55.2
1962	14,520	216.1	11,494	156.5	3,026	59.6
1963	15,109	144.4	12,154	102.1	2,955	42.3
1964	14,110	198.6	10,577	151.4	3,533	47.2
1965	12,475	171.3	9,137	127.1	3,338	44.1
1966	14,634	173.2	11,425	126.7	3,209	46.5
1967	12,861	194.1	10,037	143.9	2,824	50.2
1968	11,462	174.5	8,109	121.2	3,353	53.3
1969	13,083	181.5	9,406	135.2	3,677	46.3
1970	15,061	238.8	11,099	185.8	3,962	52.9
1971	13,634	191.0	8,854	133.2	4,780	57.7
1972	12,093	171.1	8,677	112.6	3,416	58.5
1973	NA	224.7	NA	170.2	NA	54.5
1974	NA	310.2	NA	231.8	NA	78.4
1975	NA	423.6	NA	325.0	NA	98.6
1976	NA	352.3	NA	246.5	NA	105.8
1977	NA	279.1	NA	207.5	NA	71.7
1978	NA	371.0	NA	258.2	NA	112.8
1979	NA	395.6	NA	283.5	NA	112.0
1980	NA	630.8	NA	482.3	NA	148.5
1981(r)	NA	675.0	NA	518.3	NA	156.7
1982(p)	NA	426.6	NA	308.9	NA	117.8

NA - Not Available.   p - Preliminary.   r - Revised.

(a) Complete machines as shipped, including accessories, etc., ordered and shipped with the machinery at manufacturers' selling price, f.o.b, factory. Excludes rebuilt machines, machines designed primarily for home workshops, laboratories, garages, etc., and parts.

(b) Includes some metalworking type machines other than machine tools prior to 1973.

Note: See note on page 156.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

1970 to 1978

(Values in Thousands of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978
METAL CUTTING									
Boring									
Vertical Boring and Turning Mills, Standard Type	NA	NA	NA	NA	NA	NA	NA	NA	NA
Precision Boring	$ 1,918	$2,089	D	$ 1,036	$ 5,565	$ 4,755	$ 1,973	$ 644	$ 1,260
Gear Cutting									
Gear Hobbers	431	8,749	D	10,988	9,914	9,802	5,076	6,808	9,501
Gear Tooth Finishing	9,176								
Grinding									
External Cylindrical									
Plain	2,816	7,688	$8,535	8,394	15,046		2,710	14,786	2,844
Roll and Centerless	3,416					17,796	19,665		12,205
All Other	10,064								
Surface Grinding	5,175	2,280	D	5,422	5,235	7,426	5,096	6,801	7,829
Special Tool & Cutter Grinding	2,553	2,854	1,996	920	D	3,897	5,897	15,779	4,856
Honing	1,694	1,015	D	1,559	2,077				
Lathes									
Manufacturing and Tool Room (Up to 36")	1,089	1,900	1,789	1,959	4,111	4,985	5,430	3,143	2,010
Automatic Chucking									
Single Spindle	1,487	1,558	1,660	1,518	2,742	8,514	5,744	4,817	10,181
Multiple Spindle	9,502	7,159	3,173	5,229	4,203	4,882	5,493	3,193	
Screw (bar) Machines	7,165	6,637	6,194	6,693	7,474	10,707	7,974	7,813	2,451
Milling									
Profile and Duplicator	5,074	3,062	1,643	2,499	1,645	2,992	D	D	2,325
Broaching	3,096	1,711	541	3,165	2,142	5,891	3,052	D	8,368
Sawing and Cut-off Machines	NA	NA	4,121	4,541	3,402	10,351	6,541	3,399	8,056
Transfer Machines	18,807	6,533	9,755	39,494	31,240	93,541	34,406	12,423	27,988
METAL FORMING									
Power Shearing									
Plate	2,322	765	1,554	2,699	3,303	8,023	7,942	7,944	5,044
Rotary								143	191
Bending and Forming, Power									
Bending Rolls, Sheet & Plate	800	1,799	2,313	2,348	9,194	3,592	3,413	3,936	2,727
Bending Brakes and Folders	1,025								
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mechanical Presses									
Vertical Straight-sided and Arch Frame (Excl. Knuckle Joint)									
Single Action, Single Point, 201 Tons and Over	940	2,256	2,766	1,256	D	5,452	D	D	D
Single Action, Two Point, 500 Tons and Under (a)	1,327								
Hydraulic and Pneumatic Extrusion Presses	7,120	2,194	D	1,905	D	D	D	D	D

NA - Not Available. D - Withheld to avoid disclosing individual companies' data.

(a) Beginning in 1973: Single Action, Two Point, 300 Tons and Under.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL CUTTING MACHINE TOOLS
1979 to Date1982
(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1982
METAL CUTTING MACHINE TOOLS	$283.5	$482.3	$518.3	$308.9
Boring Machines	9.5	17.7	D	14.2
Drilling Machines	4.2	12.2	12.1	13.7
Valued under $2,500	.3	.2	.2	D
All other Drilling Machines	3.9	12.0	12.0	D
Gear Cutting Machines	D	D	D	D
Grinding, Polishing, Buffing, Honing & Lapping Machines	42.0	75.4	88.2	67.9
Valued under $2,500	.7	.6	.6	.4
External Cylindrical Grinding Plain (incl. angular wheel type) & Universal	6.3	D	10.4	10.3
Roll, Centerless, & Chuck type grinders	D	D	30.4	26.4
All other External types	5.7	D		
Internal Cylindrical Grinding Surface Grinding Machines:				
Rotary & Reciprocating table type	5.4	10.3	10.3	9.2
All other Surface Grinders	D	2.0	36.5	.9
All other Grinding Machines	D	15.3		4.4
Honing & Lapping Machines	5.6	18.3		16.2
Polishing & Buffing Machines				
Horizontal NC Turning Machines	16.9	21.6	21.2	16.5
Vertical NC Turning Machines	D	D	D	D
Non-NC Turning Machines	28.7	29.2	37.3	17.1
Valued under $2,500	1.4	1.5	D	D
Engine or Tool Room lathes, swing over cross slide	D	D	3.1	D
Turret lathes, horizontal	D	D	6.4	D
Automatic lathes				
Single Spindle	D	D		D
Multiple Spindle	10.5	14.7	26.3	D
All other Horizontal lathes				
All other Vertical lathes	D	D	D	D
Milling Machines	20.1	27.9	33.4	21.0
Machining Centers	D	57.9	43.0	D
Drill, Mill, Bore, manual tool change	D	D	D	D
Drill, Mill, Bore, (ATC)				
Vertical	12.3	18.4	15.0	D
Horizontal	33.7	36.2	24.4	19.3
All other Machining Centers	D	D	D	D
Station Type Machines	47.4	133.9	111.0	D
Other Metal Cutting Machines	26.6	39.3	57.8	46.5

NA - Not Available. D - Withheld to avoid disclosure.

Source: U.S. Commerce Department, Current Industrial Reports, MQ-35W.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS

1979 to Date1982

(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1982
METAL FORMING MACHINE TOOLS	$112.0	$148.5	$156.7	$117.8
Punching, Shearing, Bending and Forming Machines	41.3	63.2	59.3	35.5
All Punching & Shearing valued under $2,500	.3	.5	.6	.3
Punches, incl. combination Punching & Shearing Machines	11.7	21.7	13.6	3.2
Punching Machines fixed position and two axes positioning table		10.3		7.0
Plate Shearing Machines	4.8		9.3	5.7
Other Punching & Shearing				
All Bending & Forming valued under $2,500	.7	1.0	.9	.7
Press Brakes				
Bending Rolls				
Rotary Bending & Forming Machines (incl. Rotary Head)	11.9	15.5	16.6	9.0
Ram & Press Bending Machines.				
Other Bending & Forming	11.9	14.2	12.3	9.7
Presses, except forgings	27.7	35.1	43.1	36.3
Presses valued under $2,500	.4	.7	.2	.4
Mechanical Presses:				
Open Back Inclinable	2.1	D	3.8	D
Other Mechanical Presses	16.7	22.7	25.0	15.4
Hydraulic Presses	8.6	D	14.3	D
Forging Machines	D	D	D	D
Other Metal Forming Machines	D	D	D	D
Thread Rolling	D	D	D	D
Metal Container Making Machinery	NA	NA	NA	10.3(a)
Die Casting	D	D	D	D
Riveting Machines	D	D	D	D
Other Metal Forming Machines	16.2	25.7	19.4	7.7

NA - Not Available. D - Withheld to avoid disclosure.

(a) "Metal Container Making Machinery" was included with "Other Metal Forming Machines" prior to 1982.

Source: U.S. Commerce Department, Current Industrial Reports, MQ-35W.

6

WORLD MACHINE TOOL INDUSTRY

For many years American Machinist magazine has been publishing estimates of the world's machine tool production and trade. These estimates, which cover 33 countries, come from unofficial sources and are revised for previous years when "official" figures become available. Whenever possible, data include complete machine tools only and exclude parts and attachments. However, for some countries it is not clear if the totals include or exclude the value of parts.

Several years ago, the trade associations of 14 European countries (co-operating through a group called CECIMO) and the United States and Japanese trade associations agreed to develop a uniform international statistical reporting system. Under this system, the production, exports and imports of the participating countries are reported for seven major groups of metal cutting machine tools and three major groups of metal forming machine tools. Data by machine type for 1981 are included in this chapter. The machine tool production of the 16 countries totaled about $18.8 billion in 1981.

Harmonization

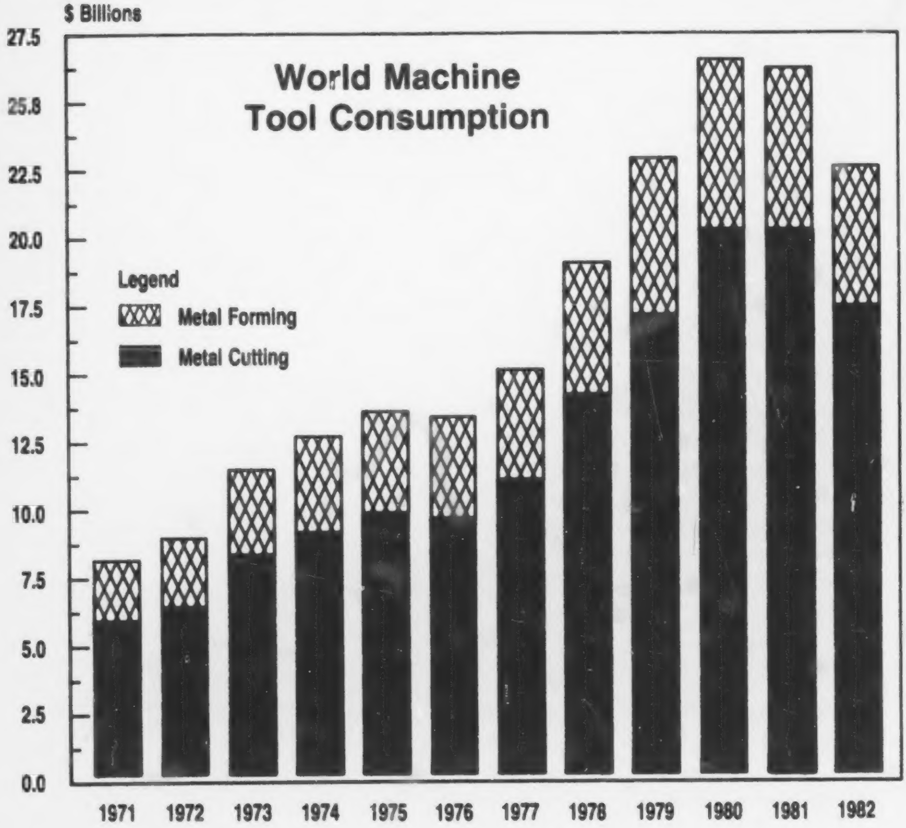
The United States is participating, through its International Trade Commission, in the technical work of the Harmonized Systems Committee of the Customs Co-Operation Council (CCC) in Brussels.

The objective of the work of the Customs Co-Operation Council is to extend the Brussels Tariff Nomenclature (BTN) into a worldwide, uniform nomenclature for use by customs officials. Such a system has obvious advantages for market analysis and for a variety of other purposes.

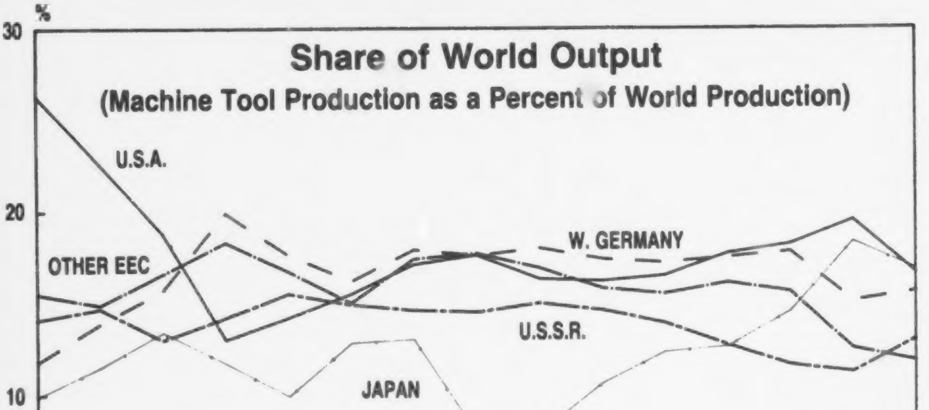
Machine tools are part of Chapter 84 which is currently under consideration. The International Trade Commission has presented proposed machine tool import and export classifications to the CCC for consideration. Discussions by the CCC are currently in progress but no significant changes have yet been ratified by the Council.

Foreign Exchange Rates

With the "floating" of many world currencies, the value measurement of production and trade statistics has become increasingly difficult and confusing. Foreign data in this Handbook have been converted into dollars on the basis of the trade conversion factors given in the International Monetary Fund's "International Financial Statistics."



World Machine Tool Consumption



Share of World Output

(Machine Tool Production as a Percent of World Production)

WORLD MACHINE TOOL PRODUCTION, 1966 to Date

(Millions of U.S. Dollars) (a)

	Total	Metal Cutting	Metal Forming
1966	$ 5,968.6	$ 4,228.4	$ 1,515.8
1967	6,624.2	4,894.3	1,678.7
1968	6,543.3	4,941.2	1,552.6
1969	7,474.6	5,590.9	1,833.7
1970	8,268.2	6,069.2	2,142.0
1971	8,148.9	5,951.5	2,192.4
1972	8,965.1	6,433.1	2,532.0
1973	11,548.1	8,393.2	3,154.9
1974	12,656.3	9,190.0	3,466.3
1975	13,640.0	9,844.3	3,795.7
1976	13,387.4	9,672.5	3,714.9
1977	15,126.5	11,079.8	4,046.7
1978	19,088.4	14,192.8	4,889.4
1979	22,925.1	17,170.1	5,755.0
1980	26,501.3	20,268.4	6,232.8
1981(r)	26,209.5	20,274.9	5,934.5
1982(p)	22,539.3	17,487.1	5,052.2

p - Preliminary.   r - Revised.

(a) Metal Cutting and Metal Forming may add to less than the total because a breakdown was not available for some countries.

Source: McGraw-Hill, Inc. "American Machinist," Uniform International Statistics on Machine Tools, and statistics reported by individual countries' machine tool associations.

For many years, the "American Machinist" has published estimates of world machine tool production. When it was possible to do so, parts and attachments were excluded. Beginning with 1974, the trade associations of 14 European countries, the United States, and Japan have been collecting statistics on production, exports, and imports on a uniform basis. For details, see chapter introduction.

LEADING MACHINE TOOL CONSUMING NATIONS (a)

1981 and 1982

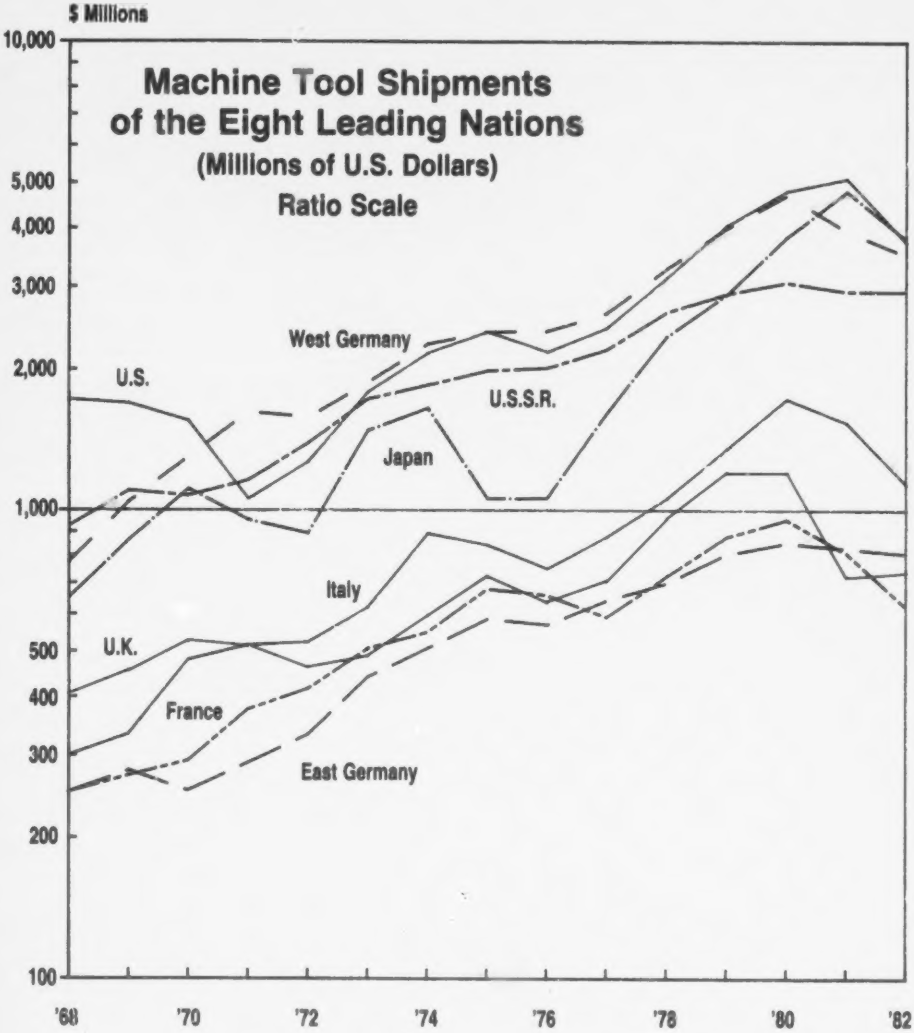
(Millions of U.S. Dollars)

			Percent Change(b)	
Country	1982	1981	U.S. Dollars	Nat'l. Currency
1. United States	$4,387.4	$5,593.2	−21.6%	−21.6%
2. Soviet Union	3,649.0	3,641.8	+0.2	+1.7
3. Japan	2,751.7	3,327.1	−17.3	−6.6
4. FRG (West Germany)	1,885.5	2,102.4	−10.3	−3.7
5. France	806.4	985.6	−18.2	−1.1
6. Italy	707.3	1,044.5	−32.3	−19.4
7. United Kingdom	703.9	576.1	+22.1	+41.5
8. Rumania	668.5	803.3	−16.8	−16.8
9. PRC (China)	575.0	535.0	+7.5	+19.0
10. Canada	395.7	843.9	−53.1	−51.7
11. Korea	385.0	470.6	−18.2	−12.3
12. GDR (East Germany)	363.0	368.7	−1.5	+5.8
13. Yugoslavia	310.0	352.6	−12.1	+27.1
14. Brazil	301.0	354.7	−15.1	+62.1
15. Poland	300.0	340.0	−11.8	—
16. India	290.6	254.1	+14.4	+24.9
17. Austria	280.1	292.1	−4.1	+2.7
18. Bulgaria	274.3	268.4	+2.2	+2.2
19. Spain	261.4	255.1	+2.5	+22.0
20. Australia	240.6	257.2	−6.5	+4.6
21. South Africa	229.2	281.8	−18.7	+1.3
22. Czechoslovakia	222.4	215.6	+3.2	−3.1
23. Mexico	216.0	470.0	−54.0	−0.6
24. Switzerland	212.1	294.7	−28.0	−25.6

(a) Machine tool consumption is domestic production plus imports and minus exports.

(b) Percent change calculations based on U.S. dollars include the effect of changes in currency conversion rates. Percent change calculations based on national currency differ for some countries. These percent change values are not influenced by currency conversion rates and, therefore, may more realistically reflect changes in a nation's machine tool consumption.

Source: McGraw-Hill, Inc., "American Machinist," International Statistics on Machine Tools and NMBTA.


$ Millions
Machine Tool Shipments
of the Eight Leading Nations
(Millions of U.S. Dollars)
Ratio Scale
10,000
5,000
4,000
3,000
2,000
1,000
500
400
300
200
100
West Germany
U.S.
U.S.S.R.
Japan
Italy
U.K.
France
East Germany
'68
'70
'72
'74
'76
'78
'80
'82

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1982 (ESTIMATED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 3,794.8	$ 3,141.5	$ 653.5	$1,263.4	$ 220.3
2. United States	3,744.3	2,918.8	825.5	574.6	1,217.7
3. FRG (West Germany)	3,504.9	2,425.9	1,079.0	2,129.0	509.6
4. Soviet Union*	2,934.0	2,268.7	665.3	245.0(c)	960.0(c)
5. Italy	1,138.6	773.6(a)	365.0(a)	639.9	208.6
6. GDR (East Germany)*	808.0	615.0	193.0	642.0	197.0
7. Switzerland	768.4	729.0	39.4	714.0	157.7
8. United Kingdom	735.5	630.4	105.1	436.0	404.4
9. France	622.1	492.8(a)	129.3(a)	295.0	479.3
10. Rumania*	615.5	560.9	54.6	144.5	197.5
11. PRC (China)*	470.0(c)	350.0(c)	120.0(c)	25.0(c)	130.0(c)
12. Czechoslovakia*	438.8	379.2	59.6	329.1	112.7
13. Yugoslavia	303.8	207.1	96.7	95.6	101.8
14. Spain	260.2	181.9(a)	78.3(a)	175.5	176.7
15. Poland*	280.0(c)	250.0(c)	30.0(c)	120.0(c)	140.0(c)
16. Canada	221.5	170.2	51.3	154.5	328.7
17. Sweden	179.8	108.2	71.6	138.5	151.2
18. India	211.3	179.6	31.7	26.4	105.7
19. Bulgaria*	221.0(c)	198.9(c)	22.1(c)	219.7(c)	273.0(c)
20. Brazil	210.5	159.9	50.6	20.8	111.3
21. Korea	200.0	130.0	70.0	65.0	250.0
22. Taiwan	199.9	189.4	10.5	149.2	80.9
23. Hungary*	130.6	112.9	17.7	97.8	126.8
24. Austria	105.3	70.2	35.1	97.1	271.9
25. Belgium	88.8	28.4	60.4	116.0	123.6
26. Israel	70.0(c)	55.0(c)	15.0(c)	25.0	100.0
27. Australia	61.7(c,j)	39.0(c,j)	22.7(c,j)	4.9(j)	183.8(j)
28. Netherlands	42.8	25.8	17.0	69.7	107.5
29. Denmark	38.9	15.0	23.9	37.5	24.5
30. Singapore	40.2	34.6	5.6	22.0	107.4
31. Argentina	35.3(c)	18.8(c)	16.5(c)	15.6	47.0
32. South Africa	21.2	8.5(c)	12.7(c)	4.0(c)	212.0(c)
33. Mexico	18.0(c)	9.0(c)	9.0(c)	2.0(c)	200.0(c)
34. Portugal	16.0(c)	7.0(c)	9.0(c)	3.1	50.2
35. Hong Kong	7.6(c)	1.9(c)	5.7(c)	4.3	4.5
Total	22,539.3	17,487.1	5,052.2	9,101.7	8,073.3

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.

* - Countries with controlled currencies. The Soviet Union has been converted at 80% of the official rate; GDR has been converted at 65% of the current FRG rate; Czechoslovakia, Hungary, Poland and Romania were at the official rate; China and Bulgaria are rough estimates based on estimates of the amount of production.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. Most estimates for 1982 have been converted at International Monetary Fund rates for the first nine months of 1982 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1982 average rates.

Notes: Whenever possible, data include machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Source: McGraw-Hill, Inc., "American Machinist," and NMTBA.

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1981 (REVISED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. United States	$ 5,111.3	$ 4,046.6	$1,064.3	$ 949.6	$1,431.5
2. Japan	4,797.1	3,860.3	936.8	1,685.5	215.5
3. FRG (West Germany)	3,953.4	2,774.2	1,179.3	2,448.8	597.8
4. Soviet Union*	2,932.3	2,268.5	663.8	242.4	951.9
5. Italy	1,539.4	1,047.2(a)	492.2(a)	795.2	300.3
6. Switzerland	846.2	785.6	60.6	740.3	188.8
7. GDR (East Germany)*	827.7	632.8	194.9	673.6	214.6
8. France	809.5	625.9	183.6	390.5	566.6
9. United Kingdom	720.7	616.7	104.0	570.3	425.7
10. Rumania*	624.9	578.7	46.2	133.1	311.5
11. China*	440.0(u)	330.0(u)	110.0(u)	30.0(u)	125.0(u)
12. Czechoslovakia*	357.8	311.5	46.3	310.4	168.2
13. Spain	320.0	219.6	100.4	206.8	141.9
14. Poland*	310.0(u)	270.0(u)	40.0(u)	170.0(u)	200.0(u)
15. Brazil	305.0	231.7	73.3	73.9	123.6
16. Yugoslavia	276.7	188.0	88.7	55.1	131.0
17. Canada	269.2	208.0	61.2	99.8	674.5
18. Taiwan	249.4	237.2	12.2	182.6	99.2
19. Sweden	210.9	138.3	72.6	164.3	191.6
20. Bulgaria*	201.5	182.0(c)	19.5(c)	200.9	267.8
21. India	184.6	148.7	35.9	17.1	86.6
22. Korea	178.1	115.8	62.3	32.0	324.5
23. Hungary*	127.7	111.2	16.5	95.7	127.3
24. Austria	108.4	74.5	33.9	108.4	292.1
25. Belgium	103.3	33.1	70.2	119.2	139.5
26. Israel	70.0(c)	55.0(c)	15.0(c)	33.8	71.5
27. Australia	68.9(c,j)	43.6(c,j)	25.3(c,j)	7.3(j)	195.6(j)
28. Netherlands	55.5	28.3	27.2	74.8	113.5
29. Singapore	43.5	38.8	4.7	27.0	114.4
30. Denmark	41.6	16.9	24.7	47.9	45.1
31. South Africa	36.8	14.7(c)	22.0(c)	5.0(c)	250.0(c)
32. Argentina	35.3(u)	18.8(u)	16.5(u)	19.5(u)	70.0(u)
33. Mexico	24.0(u)	12.0(u)	12.0(u)	4.0(u)	450.0(u)
34. Portugal	16.3(u)	7.3(u)	9.0(u)	4.1	53.9
35. Hong Kong	12.5(c)	3.1(c)	9.4(c)	4.1	4.0
Total	26,209.5	20,274.9	5,934.5	10,723.0	9,665.0

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.
(u) Unrevised.

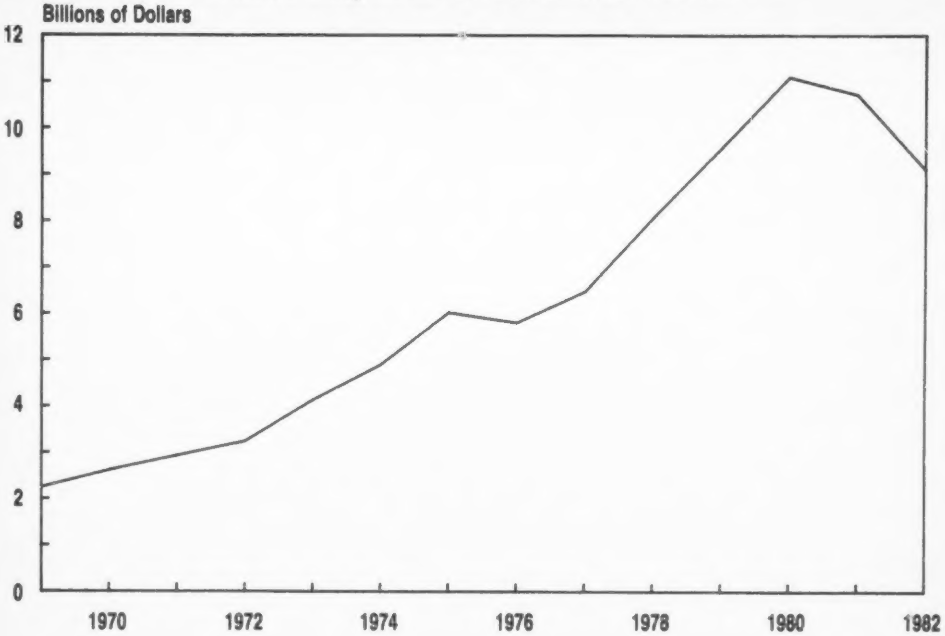
* - Countries with controlled currencies. The Soviet Union has been converted at 80%, of the official rate; GDR has been converted at 65% of the current FRG rate; Czechoslovakia, Hungary, Poland, Romania were at the official rate; China and Bulgaria are rough estimates based on estimates of the amount of production.

Exchange Rates: All free market currencies have been converted at rates for the period covered. Values were converted at average market rates for 1980 as reported by the International Monetary Fund.

Notes: Whenever possible, data include complete machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

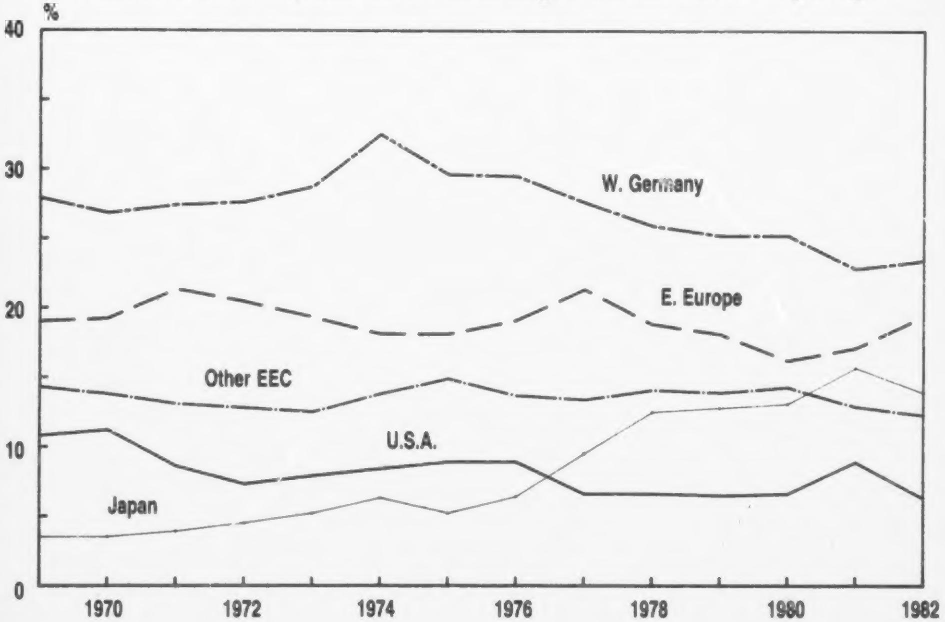
Source: McGraw-Hill, Inc., "American Machinist," and NMTBA.

World Exports of Machine Tools



Share of World Exports

(Machine Tool Exports as a Percentage of Total World Exports)



PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS

Selected Countries, 1979 to Date

(Millions of U.S. Dollars)

	Production			Exports			Imports		
Country	1979	1980	1981	1979	1980	1981	1979	1980	1981
Austria	$ 101.1	$ 127.8	$ 108.4	$ 118.0	$ 131.3	$ 108.4	$ 135.6	$ 165.6	$ 292.1
Belgium	130.8	137.2	103.3	110.8	135.1	119.2	127.0	205.6	139.5
Denmark	69.2E	49.1*	41.6	64.6E	85.9*	47.9	73.4E	92.6*	45.1
France	877.2	953.9	809.4	458.2	516.1	390.4	371.6	554.0	566.5
India	127.1	162.7	184.6	18.5	17.5	17.1	NA	63.6	86.6
Italy	1,354.0	1,728.0	1,512.1	689.0	847.6	795.2	255.0	356.1	300.0
Japan	2,896.1	3,830.3	4,796.9	1,238.7	1,461.0	1,692.9	164.8	221.4	215.7
Netherlands	NA	74.4	60.5	70.8	91.6	74.2	129.1	155.0	110.6
Norway	6.5E	7.1*E	6.4E	4.7E	4.5*	4.2	50.2E	69.6*	62.0
Portugal	22.4	28.0*E	16.2	5.7	6.6*E	4.1	32.7	30.0*E	53.9
Spain	315.8	327.7	319.6	210.8	228.2	206.8	91.3	103.2	141.8
Sweden	199.2	231.7	204.8E	175.2	180.9	164.3	126.9	184.9	191.6
Switzerland	930.4	994.0	846.2	790.9	869.9	740.3	139.6	320.0*	188.9
United Kingdom	1,027.4	1,201.7	720.7	472.2	674.2	577.7E	601.1	622.2	432.6
United States	4,060.0	4,815.0	5,131.0	621.0	735.0	949.0	1,044.0	1,260.0	1,432.0
West Germany	4,009.5	4,708.1	3,953.1	2,509.2	2,964.7	2,584.9	621.4	802.2	616.4

NA - Not Available.   E - Estimate.   * Includes Parts and Accessories.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de la Machine Outil); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS

Selected Countries, 1981

(Millions of U.S. Dollars)

Country	Production			Exports			Imports		
	Total	Cutting	Forming	Total	Cutting	Forming	Total	Cutting	Forming
Austria	$ 108.4	$ 74.5	$ 33.9	$ 108.4	$ 65.8	$ 42.6	$ 292.1	$ 210.5	$ 81.6
Belgium	103.3	33.1	70.2	119.2	66.9	52.3	139.5	105.5	34.0
Denmark	41.6	NA	NA	47.9	NA	NA	45.1	NA	NA
France	809.4	625.8	183.6	390.4	255.0	135.4	566.5	441.6	124.9
India	184.6	148.7	35.9	17.1	15.4	1.7	86.6E	NA	NA
Italy	1,512.1	1,028.3	483.8	795.2	603.4	191.8	300.0	234.9	65.1
Japan	4,796.9	3,860.1	936.8	1,692.9	1,409.1	283.8	215.7	175.1	40.6
Netherlands	60.5	NA	NA	74.2	39.3	34.9	110.6	76.9	33.7
Norway	6.4E	NA	NA	4.2	NA	NA	62.0	NA	NA
Portugal	16.2	NA	NA	4.1	NA	NA	53.9	NA	NA
Spain	319.6	219.3	100.3	206.8	155.3	51.5	141.8	46.6	95.2
Sweden	204.8E	127.4E	77.4E	164.3	100.9	63.4	191.6	134.9	56.7
Switzerland	846.2	785.6	60.6	740.3	702.6	37.7	188.9	NA	NA
United Kingdom	720.7	616.7	104.0	577.7E	472.7E	105.0E	432.6	331.2	101.4
United States	5,131.0	4,052.0	1,079.0	949.0	668.0	281.0	1,432.0	1,246.0	186.0
West Germany	3,953.1	2,778.3	1,174.8	2,584.9	1,664.5	900.4	616.4	449.1	167.3

NA - Not Available. E - Estimate.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de le Machine Outil); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

The Uniform International Statistics prepared by CECIMO indicate 1981 production by 16 countries of $18.8 billion of machine tools. Individual country figures on the following pages may differ because of problems in conversion of exchange rates, differences in reporting practices, etc.

PRODUCTION OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1981
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 74.5	$ 8.0	(a)	$ 0.0	$ 9.5	$ 25.6	$ 17.6	$ 13.8
Belgium	33.1	NA	NA	NA	NA	NA	NA	NA
Denmark	41.6	NA	NA	NA	NA	NA	NA	NA
France	625.7	2.0	$ 13.6	0.0	52.1	145.5	144.6	267.9
India	148.6	11.4	9.9	3.8	17.1	59.1	19.7	27.6
Italy	1,028.2	94.1	43.1	13.2	117.9	235.7	102.0	422.2
Japan	3,860.0	159.0	74.1	89.4	439.7	1,040.4	338.5	1,718.9
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA
Norway	6.4	NA	NA	NA	NA	NA	NA	NA
Portugal	16.2	NA	NA	NA	NA	NA	NA	NA
Spain	219.2	18.7	13.9	0.4	23.1	61.1	75.6	26.4
Sweden(E)	127.4	1.4	(a)	0.0	46.4	49.4	25.7	4.5
Switzerland	785.6	NA	NA	NA	NA	NA	NA	NA
United Kingdom(E)	616.6	15.6	15.2	14.2	104.0	175.0	50.1	242.5
United States	4,052.0	231.0	140.0	133.0	615.0	816.0	437.0	1,680.0
West Germany	2,778.4	160.2	83.2	142.5	478.8	738.9	389.8	785.0

NA - Not Available. E - Estimate.

(a) Included in "Boring Machines."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

PRODUCTION OF METAL FORMING MACHINE TOOLS
Selected Countries, 1981
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 33.9	$ 2.4	$ 4.4	$ 27.1
Belgium	70.2	NA	NA	NA
Denmark	NA	NA	NA	NA
France	183.6	24.1	77.1	82.4
India	35.9	3.5	15.4	17.1
Italy	483.8	45.7	143.4	294.7
Japan	936.8	103.0	740.8	93.0
Netherlands	NA	NA	NA	NA
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	100.3	15.6	59.8	24.9
Sweden(E)	77.4	33.0	(a)	44.4
Switzerland	60.6	NA	NA	NA
United Kingdom(E)	104.0	0.0	34.9	69.2
United States	1,079.0	208.0	523.0	348.0
West Germany	1,174.8	161.5	513.3	500.0

NA - Not Available. E - Estimate.

(a) Included in "Punching & Shearing."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1981
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 210.5	$20.0	(a)	$ 0.3	$ 38.2	$ 28.2	$ 36.5	$ 87.3
Belgium	105.5	4.8	$10.4	1.0	12.6	29.0	15.2	32.5
Denmark	45.1	NA	NA	NA	NA	NA	NA	NA
France	441.6	38.3	43.2	19.3	73.2	102.9	62.9	101.8
India	NA	NA	NA	NA	NA	NA	NA	NA
Italy	234.9	15.0	12.3	8.8	26.4	61.6	36.9	73.9
Japan	175.1	7.7	3.9	30.3	66.8	27.3	15.3	23.8
Netherlands	76.8	6.8	8.0	0.4	16.4	25.2	11.2	8.8
Norway	62.0	NA	NA	NA	NA	NA	NA	NA
Portugal	53.9	NA	NA	NA	NA	NA	NA	NA
Spain	46.6	0.8	1.1	0.6	13.2	16.0	1.5	13.4
Sweden	134.9	6.7	(a)	3.0	22.7	35.7	25.7	41.1
Switzerland	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	331.2	26.5	14.8	7.3	48.0	94.0	49.3	91.3
United States	1,246.0	87.0	26.0	37.0	137.0	480.0	125.0	354.0
West Germany	448.9	61.9	37.6	8.8	88.5	129.6	74.3	48.2

NA - Not Available.

(a) Included in "Boring Machines."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF METAL FORMING MACHINE TOOLS
Selected Countries, 1981
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 81.6	$ 6.6	$13.5	$ 61.5
Belgium	34.0	8.0	5.6	20.4
Denmark	NA	NA	NA	NA
France	124.9	28.0	36.4	60.5
India	NA	NA	NA	NA
Italy	65.2	10.6	23.8	30.8
Japan	40.6	4.4	5.9	30.3
Netherlands	33.6	11.6	7.2	14.8
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	95.3	3.4	79.0	12.9
Sweden	56.7	37.3	(a)	19.4
Switzerland	NA	NA	NA	NA
United Kingdom	101.4	25.8	37.3	38.3
United States	186.0	51.0	60.0	75.0
West Germany	167.3	22.1	41.2	104.0

NA - Not Available.

(a) Included in "Punching & Shearing."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF METAL CUTTING MACHINE TOOLS
Selected Countries, 1981
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Machines
Austria	$ 65.8	$ 6.8	$ (a)	$ 0.0	$ 10.7	$ 29.8	$ 14.8	$ 3.7
Belgium	66.9	7.5	8.5	1.7	4.7	28.2	3.3	13.0
Denmark	47.9	NA	NA	NA	NA	NA	NA	NA
France	254.9	13.4	12.3	1.8	48.9	68.1	65.7	44.7
India	15.4	0.2	3.0	0.0	1.4	8.2	1.2	1.4
Italy	603.4	73.9	52.8	2.6	67.7	102.9	78.3	225.2
Japan	1,409.2	59.4	27.4	10.9	111.9	575.8	77.2	546.6
Netherlands	39.2	8.8	2.8	NA	15.2	5.2	3.6	3.6
Norway	4.2	NA	NA	NA	NA	NA	NA	NA
Portugal	4.1	NA	NA	NA	NA	NA	NA	NA
Spain	155.4	12.9	11.1	0.3	15.8	36.7	62.9	15.7
Sweden(E)	100.9	11.3	(a)	0.2	42.7	28.6	12.8	5.3
Switzerland	702.6	NA	NA	NA	NA	NA	NA	NA
United Kingdom	472.6	37.9	31.0	12.2	87.8	141.3	86.4	76.0
United States	668.0	79.0	24.0	80.0	127.0	90.0	38.0	230.0
West Germany	1,684.6	135.0	44.7	82.3	358.4	446.9	223.9	393.4

NA - Not Available. E - Estimate.

(a) Included in "Boring Machines."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF METAL FORMING MACHINE TOOLS
Selected Countries, 1981
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 42.6	$ 1.5	$ 2.4	$ 38.7
Belgium	52.3	9.1	28.8	14.4
Denmark	NA	NA	NA	NA
France	135.5	19.7	32.4	83.4
India	1.7	0.1	0.9	0.7
Italy	191.8	21.1	66.9	103.8
Japan	283.8	76.1	85.1	122.6
Netherlands	34.8	9.2	4.4	21.2
Norway	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	51.5	11.6	17.2	22.7
Sweden	63.4	31.6	(a)	31.8
Switzerland	37.7	NA	NA	NA
United Kingdom(E)	105.0	17.6	38.5	48.9
United States	281.0	45.0	101.0	135.0
West Germany	900.4	107.5	279.6	513.3

NA - Not Available. E - Estimate.

(a) Included in "Punching & Shearing."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
World																		
1974	$3,886	100.0%	$449	12.6%	$1,567	40.3%	$ 307	7.9%	$398	10.3%	$319	8.2%	$250	6.4%	$236	6.1%	$ 93	2.4%
1975	4,620	100.0	580	12.5	1,748	37.8	309	6.7	440	9.5	431	9.3	362	7.8	320	6.9	113	2.5
1976	4,428	100.0	553	12.5	1,670	37.7	363	8.2	457	10.3	364	8.2	317	7.2	272	6.1	115	2.6
1977	4,855	100.0	458	9.4	1,772	36.5	611	12.6	498	10.2	437	9.0	323	6.7	269	5.5	123	2.5
1978	6,279	100.0	585	9.3	2,086	33.2	1,017	16.2	659	10.5	598	9.5	426	6.8	383	6.1	139	2.2
1979	7,440	100.0	685	9.2	2,441	32.8	1,229	16.5	792	10.6	690	9.3	474	6.4	459	6.2	176	2.4
1980	8,679	100.0	831	9.6	2,739	31.6	1,454	16.8	871	10.0	845	9.7	674	7.8	516	5.9	181	2.1
Industrial Countries																		
United States																		
1974	$ 308	100.0%	—	—	$ 85	27.6%	$ 52	16.7%	$ 36	11.6%	$ 20	6.4%	$ 30	9.9%	$ 14	4.4%	$ 10	3.2%
1975	322	100.0	—	—	95	29.4	54	16.8	29	9.1	17	5.3	39	12.2	15	4.6	11	3.3
1976	317	100.0	—	—	97	30.7	70	22.0	27	8.5	15	4.7	34	10.8	9	2.7	8	2.7
1977	422	100.0	—	—	106	25.0	111	26.4	35	8.3	17	4.1	47	11.0	10	2.5	18	4.2
1978	678	100.0	—	—	166	24.6	219	32.3	59	8.7	30	4.4	73	10.8	18	2.6	25	3.7
1979	974	100.0	—	—	191	19.6	365	37.5	71	7.3	41	4.2	96	9.9	26	2.6	32	3.3
1980	1,264	100.0	—	—	243	19.2	519	41.1	95	7.5	58	4.6	135	10.7	31	2.4	31	2.4
West Germany																		
1974	167	100.0	$ 17	10.4%	—	—	8	4.8	50	29.8	24	14.1	13	7.8	20	11.9	47	3.9
1975	191	100.0	14	7.4	—	—	9	4.9	54	28.5	30	16.0	18	9.5	26	13.4	7	3.9
1976	201	100.0	17	8.2	—	—	10	4.9	60	30.0	28	13.8	19	9.3	21	10.5	10	4.9
1977	290	100.0	25	8.5	—	—	23	7.9	80	27.5	53	18.3	23	7.8	27	9.4	16	5.5
1978	381	100.0	31	8.1	—	—	39	10.2	122	32.1	56	14.6	29	7.6	37	9.6	14	3.7
1979	537	100.0	32	5.9	—	—	83	15.4	174	32.5	71	13.2	32	5.9	48	9.0	18	3.3
1980	685	100.0	36	5.3	—	—	108	15.8	206	30.0	102	14.9	59	8.6	55	8.0	25	3.7

(Continued)

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
France																		
1974	$268	100.0%	$ 12	4.5%	$146	54.3%	$ 2	.6%	$34	12.7%	$33	12.3%	$15	5.7%	—	—	$ 3	1.3%
1975	355	100.0	16	4.5	196	55.3	1	.4	41	11.7	52	14.7	19	5.4	—	—	5	1.4
1976	320	100.0	19	5.9	162	50.7	2	.7	43	13.6	41	12.9	18	5.8	—	—	6	1.8
1977	256	100.0	11	4.3	135	52.8	2	.9	33	12.9	38	14.8	17	6.5	—	—	3	1.1
1978	267	100.0	13	5.0	117	43.8	5	1.9	48	17.9	46	17.3	16	5.9	—	—	6	2.2
1979	342	100.0	22	6.5	145	42.5	10	3.0	58	17.0	55	16.0	22	6.4	—	—	6	1.6
1980	494	100.0	23	4.7	196	39.8	31	6.2	63	12.8	95	19.2	38	7.7	—	—	7	1.5
United Kingdom																		
1974	194	100.0	28	14.4	87	44.9	6	3.3	22	13.0	15	7.8	—	—	$10	5.0%	10	5.1
1975	220	100.0	35	16.1	90	40.9	9	4.2	25	11.2	16	7.1	—	—	17	7.8	10	4.5
1976	213	100.0	38	17.5	90	41.2	9	4.1	23	10.7	12	5.3	—	—	11	5.2	14	6.2
1977	223	100.0	27	12.2	90	40.2	12	5.5	27	11.9	19	8.5	—	—	13	6.0	10	4.3
1978	356	100.0	50	14.2	149	41.7	24	6.8	36	10.1	28	7.7	—	—	19	5.3	15	4.1
1979	521	100.0	87	16.7	214	41.1	46	8.9	51	9.7	44	8.5	—	—	33	6.3	20	3.8
1980	499	100.0	67	13.4	188	37.6	69	13.8	47	9.5	50	10.1	—	—	22	4.4	19	3.9
Canada																		
1974	105	100.0	67	64.3	10	9.3	4	4.1	2	1.6	4	3.6	12	11.7	3	2.8	2	1.5
1975	126	100.0	79	62.4	14	11.5	6	4.4	2	2.0	5	3.9	13	10.1	4	2.9	2	1.7
1976	114	100.0	81	71.2	8	7.3	6	5.0	1	.5	4	3.7	9	7.8	2	1.5	2	1.7
1977	109	100.0	63	57.7	13	12.4	7	6.8	2	1.5	6	5.5	10	9.6	2	2.2	2	2.3
1978	136	100.0	82	60.1	15	11.2	9	6.9	2	1.5	10	7.0	10	7.2	4	3.1	3	1.9
1979	180	100.0	105	58.1	19	10.7	14	7.6	2	1.3	13	7.1	16	8.8	4	2.2	5	2.9
1980	283	100.0	170	59.9	30	10.6	30	10.5	4	1.6	13	4.8	25	8.8	4	1.5	4	1.4
Switzerland																		
1974	87	100.0	4	4.8	55	63.2	1	.6	—	—	9	10.0	6	6.9	7	7.8	2	2.2
1975	72	100.0	4	5.8	40	55.5	(c)	.2	—	—	9	12.6	7	9.0	7	9.9	2	2.6
1976	63	100.0	3	4.6	37	58.2	(c)	.4	—	—	8	12.9	8	12.3	3	5.2	1	1.6
1977	82	100.0	3	4.2	50	61.4	1	1.1	—	—	10	11.8	7	8.1	6	6.8	2	2.2
1978	134	100.0	5	3.5	80	59.6	2	1.5	—	—	17	12.9	11	8.1	12	8.6	3	2.0
1979	157	100.0	7	4.5	92	58.5	4	2.7	—	—	19	12.1	8	5.2	12	7.9	3	1.9
1980	229	100.0	14	6.0	122	53.4	12	5.2	—	—	28	12.1	25	10.8	17	7.3	3	1.4

Note: Footnotes on final page of table.

EXPORT MARKET SHARES C⁼ MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Japan																		
1974	$147	100.0%	$50	34.1%	$64	43.6%	—	—	$16	11.2%	$ 3	2.0%	$ 6	3.9%	$ 2	1.3%	$2	1.2%
1975	100	100.0	42	42.4	38	37.6	—	—	8	7.6	1	1.0	3	2.9	2	1.7	1	1.2
1976	60	100.0	27	45.7	15	25.7	—	—	11	17.8	1	1.4	2	3.9	2	2.5	(c)	.7
1977	75	100.0	23	30.4	35	47.4	—	—	8	10.3	1	1.8	1	1.6	2	3.1	1	1.9
1978	102	100.0	40	39.1	37	36.2	—	—	15	14.6	1	0.7	2	2.1	1	1.0	2	1.7
1979	153	100.0	51	33.0	65	42.5	—	—	20	12.9	2	1.0	3	2.2	2	1.3	3	1.8
1980	183	100.0	61	33.4	67	36.6	—	—	36	19.5	5	2.9	4	2.4	3	1.4	2	1.2
Developing Countries																		
Brazil																		
1974	203	100.0	38	18.9	98	48.6	$ 14	6.9%	11	5.7	18	9.0	11	5.6	3	1.2	2	1.1
1975	273	100.0	56	20.4	94	27.3	26	6.5	11	2.3	55	7.3	16	5.6	6	2.2	3	.6
1976	236	100.0	88	37.2	74	31.5	18	7.6	8	3.5	20	8.5	15	6.5	6	2.5	2	.7
1977	172	100.0	41	23.7	63	36.8	21	12.1	6	3.8	21	12.0	12	7.0	3	1.7	1	.7
1978	211	100.0	32	15.0	76	36.0	40	18.8	17	7.9	31	14.7	10	4.8	5	2.3	2	1.0
1979	187	100.0	24	13.0	95	50.6	22	11.9	8	4.4	15	7.8	7	3.8	2	1.2	8	4.3
1980	201	100.0	19	9.7	122	60.6	22	10.8	9	4.7	16	7.8	5	2.4	3	1.6	2	1.0
Republic of Korea																		
1974	55	100.0	4	6.5	9	16.1	41	73.9	1	1.2	(c)	(d)	(c)	.7	(c)	.1	(c)	(d)
1975	81	100.0	5	6.3	11	14.1	40	49.3	2	1.9	(c)	.1	9	11.4	12	14.9	(c)	.2
1976	98	100.0	5	5.6	7	7.6	65	67.0	1	1.5	(c)	.2	16	16.0	(c)	.2	(c)	.2
1977	164	100.0	7	4.2	18	10.9	133	81.1	2	1.4	(c)	.1	2	1.3	1	.6	(c)	.2
1978	323	100.0	24	7.5	39	12.1	231	71.6	9	2.9	NA	NA	8	2.4	7	2.3	NA	NA
1979	376	100.0	34	9.1	85	22.6	212	56.4	8	2.2	4	1.1	14	3.7	13	3.4	1	0.4
1980	156	100.0	24	15.3	24	15.3	95	60.7	4	2.7	1	0.8	3	1.7	3	1.7	(c)	0.1
Spain																		
1974	128	100.0	6	4.8	60	46.7	2	1.4	13	10.0	13	10.3	7	5.7	18	14.4	2	1.9
1975	174	100.0	28	16.2	71	40.5	1	.5	11	6.0	18	10.5	19	10.7	12	7.0	3	1.8
1976	102	100.0	6	5.7	46	45.0	2	2.1	5	4.8	13	12.9	11	10.6	9	8.8	3	2.6
1977	91	100.0	4	4.7	38	41.4	6	6.4	8	8.6	14	14.9	5	5.4	10	11.0	1	1.1
1978	89	100.0	4	4.3	37	42.0	3	3.9	6	7.1	16	17.9	4	4.7	15	16.6	1	0.9
1979	95	100.0	5	5.0	42	44.0	2	1.9	5	5.1	22	22.9	5	5.6	12	12.1	1	0.6
1980	102	100.0	14	13.2	31	30.3	3	3.1	6	5.6	17	16.9	10	10.0	16	15.9	1	1.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Venezuela																		
1974	$ 23	100.0%	$ 6	25.4%	$ 6	25.3%	(c)	.5%	(c)	1.4%	$ 7	31.9%	$ 1	2.3%	$ 1	4.0%	(c)	1.9%
1975	45	100.0	12	27.4	8	16.8	(c)	.7	(c)	1.1	17	37.6	2	4.2	3	5.6	$1	1.1
1976	55	100.0	19	35.1	11	19.9	$ 1	1.9	$ 1	1.4	16	28.7	2	4.4	1	2.0	1	1.4
1977	75	100.0	20	27.1	16	21.6	1	1.4	3	4.5	23	31.0	3	4.3	1	1.8	1	1.1
1978	85	100.0	27	31.8	16	18.5	5	5.5	2	2.2	21	24.9	3	3.3	4	4.4	1	1.1
1979	88	100.0	46	52.8	8	9.0	4	4.6	2	1.9	21	23.4	3	3.5	(c)	0.5	(c)	0.5
1980	61	100.0	21	34.5	13	21.7	2	2.9	2	3.0	18	29.6	2	3.3	1	2.0	(c)	0.7
Mexico																		
1974	71	100.0	35	49.5	19	27.1	2	2.3	2	2.3	5	6.4	2	3.2	4	5.1	1	1.0
1975	77	100.0	41	52.7	16	21.0	2	2.4	2	3.1	6	7.2	4	5.6	3	3.8	1	1.1
1976	90	100.0	53	59.3	17	18.4	1	1.1	3	3.0	5	6.1	4	4.8	3	3.6	1	.9
1977	70	100.0	42	60.1	8	10.9	9	12.1	2	2.8	4	6.2	2	3.4	(c)	.5	1	.9
1978	75	100.0	38	50.5	15	20.5	7	9.2	2	3.3	4	5.1	4	4.8	1	0.9	1	1.9
1979	121	100.0	70	58.2	20	16.7	7	5.7	3	2.9	8	6.8	4	3.2	2	1.2	2	1.8
1980	324	100.0	143	44.2	97	30.0	17	5.3	9	2.7	15	4.6	20	6.3	5	1.6	4	1.2
Turkey																		
1974	29	100.0	1	3.4	16	56.1	(c)	.7	2	8.5	5	18.7	1	4.2	1	3.0	(c)	.6
1975	54	100.0	3	5.0	29	54.0	(c)	.9	3	6.2	8	13.9	5	8.4	2	4.2	1	1.0
1976	64	100.0	1	1.6	26	40.1	2	2.4	3	5.0	9	14.2	10	15.5	3	4.7	1	1.0
1977	62	100.0	1	1.0	19	31.0	1	.9	3	5.5	9	14.4	12	19.3	15	23.6	1	1.6
1978	46	100.0	5	10.7	15	33.6	2	5.1	1	1.9	11	23.8	3	6.6	7	15.5	1	1.5
1979	40	100.0	2	3.8	13	31.4	NA	NA	5	12.8	6	15.1	4	9.5	8	19.3	NA	NA
1980	48	100.0	(c)	0.9	16	34.1	1	3.1	3	6.4	5	11.0	3	6.3	15	30.7	NA	NA
India																		
1974	37	100.0	2	5.2	17	45.4	3	7.1	6	17.3	(c)	1.1	4	10.0	3	8.4	(c)	.6
1975	53	100.0	3	5.6	24	46.2	3	4.8	7	13.1	2	3.4	6	11.1	2	3.9	1	1.3
1976	52	100.0	2	4.7	28	52.7	1	2.5	8	14.7	1	1.5	6	10.9	1	1.4	2	3.3
1977	48	100.0	4	8.8	24	49.7	1	2.1	8	15.8	(c)	.8	5	9.8	2	3.7	1	2.7
1978	70	100.0	7	9.9	32	45.6	4	5.2	14	20.6	2	3.0	6	8.0	3	4.0	NA	NA
1979	74	100.0	5	6.1	26	34.5	8	10.8	15	20.8	3	4.4	9	12.1	5	6.8	2	2.2
1980	100	100.0	10	10.2	38	37.5	12	12.3	14	14.0	5	4.8	16	15.9	2	2.1	1	0.9

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Saudi Arabia																		
1974	$ 3	100.0%	(c)	9.5%	$ 1	43.5%	(c)	2.0%	(c)	3.0%	(c)	14.4%	$ 1	17.5%	(c)	5.6%	(c)	.3%
1975	12	100.0	$ 2	16.5	4	38.0	(c)	1.1	(c)	3.8	$ 1	9.9	2	16.2	$ 1	6.6	(c)	3.4
1976	31	100.0	4	11.7	7	23.8	(c)	1.2	$ 1	4.2	5	16.7	5	14.6	6	19.8	$ 2	5.0
1977	45	100.0	8	16.9	15	34.1	$ 1	1.8	2	5.1	7	14.9	2	4.1	9	19.9	1	1.2
1978	33	100.0	9	27.1	8	25.2	3	9.2	2	5.2	6	18.3	2	6.8	1	4.5	(c)	1.3
1979	47	100.0	15	32.7	11	22.5	8	16.3	1	1.8	7	14.2	2	3.9	3	5.6	1	1.2
1980	40	100.0	11	27.4	7	18.7	3	8.6	1	2.7	8	20.0	4	8.9	3	8.0	1	1.8
China																		
1974	50	100.0	—	—	12	24.8	18	36.0	12	24.4	4	7.8	1	1.8	2	3.3	(c)	.4
1975	74	100.0	5	6.4	24	32.1	21	28.5	14	18.7	4	5.9	3	3.5	(c)	.4	[illegible]	[illegible]
1976	61	100.0	2	3.5	15	24.5	22	36.9	15	24.6	3	5.5	2	3.4	1	1.1	(c)	(d)
1977	39	100.0	4	8.9	14	35.6	3	8.4	15	38.4	(c)	.6	(c)	.2	3	6.6	(c)	(d)
1978	68	100.0	6	8.8	20	29.5	15	22.3	12	18.2	2	2.8	1	1.7	NA	NA	NA	NA
1979	112	100.0	NA	NA	34	30.7	30	27.0	24	21.1	3	2.4	4	4.0	NA	NA	NA	NA
1980	132	100.0	7	5.1	40	30.7	27	20.8	14	10.7	10	8.0	5	3.7	NA	NA	NA	NA
Argentina																		
1974	26	100.0	3	13.3	12	45.4	3	.6	3	10.2	3	11.5	2	6.5	2	9.0	(c)	.5
1975	28	100.0	4	15.0	7	23.9	(c)	10.2	1	4.8	7	26.1	2	7.9	1	4.3	1	3.8
1976	25	100.0	4	16.9	10	38.0	3	1.0	2	8.8	6	23.0	1	3.2	1	5.0	(c)	1.3
1977	30	100.0	3	10.8	9	31.1	1	1.7	5	15.3	7	21.7	2	5.2	3	9.0	(c)	1.5
1978	78	100.0	11	14.3	33	42.0	1	1.0	6	8.2	16	20.6	NA	NA	4	5.8	1	1.2
1979	64	100.0	9	13.4	24	37.6	NA	3.0	9	13.6	10	14.9	3	4.1	7	10.4	1	1.7
1980	80	100.0	14	17.7	18	21.8	2	3.0	7	8.4	23	28.0	5	5.9	10	12.7	1	1.2
Eastern Europe																		
U.S.S.R.																		
1974	449	100.0	68	15.2	185	41.2	39	8.6	46	10.2	40	8.9	9	1.9	32	7.1	9	2.1
1975	553	100.0	92	16.6	224	40.5	29	5.2	66	11.9	44	7.9	13	2.3	53	9.5	13	2.4
1976	577	100.0	48	8.3	307	53.2	24	4.1	80	13.8	39	6.7	13	2.3	25	4.3	15	2.5
1977	649	100.0	31	4.8	320	49.2	80	12.4	80	12.4	43	6.6	9	1.3	21	3.2	15	2.3
1978	637	100.0	17	2.6	301	47.3	78	12.3	71	11.1	77	12.0	NA	NA	42	6.7	5	0.8
1979	635	100.0	7	1.1	315	49.6	47	7.3	73	11.5	78	12.3	18	2.8	58	9.1	11	1.7
1980	749	100.0	26	3.4	391	52.2	67	8.9	82	10.9	68	9.1	19	2.6	67	9.0	7	1.0

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country: United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Poland																		
1974	$154	100.0%	$ 3	2.1%	$61	39.7%	$ 4	2.4%	$20	13.1%	$25	16.4%	$ 8	5.2%	$11	7.2%	$8	4.9%
1975	167	100.0	8	4.7	42	25.2	2	1.0	27	16.3	21	12.5	24	14.2	19	11.7	6	3.5
1976	205	100.0	13	6.6	56	27.3	17	8.5	26	12.8	15	7.2	15	7.5	35	17.3	8	3.8
1977	203	100.0	8	4.0	54	26.8	41	20.1	25	12.4	21	10.1	21	10.4	12	5.7	6	3.1
1978	264	100.0	25	9.4	81	30.8	26	9.9	27	10.4	22	8.4	52	19.7	10	3.6	7	2.6
1979	187	100.0	3	1.8	56	30.1	NA	NA	17	9.2	16	8.5	34	17.9	8	4.4	3	1.9
1980	114	100.0	2	1.8	38	33.6	6	5.0	17	15.2	15	13.0	14	12.0	16	14.3	3	2.4
Rumania																		
1974	51	100.0	(c)	.8	28	53.9	2	3.1	8	14.7	6	11.9	2	4.1	3	5.1	2	4.7
1975	73	100.0	2	3.2	34	46.1	2	2.5	14	19.4	7	9.3	6	7.6	3	4.0	4	6.1
1976	74	100.0	2	2.2	34	46.2	3	4.2	6	8.4	14	18.6	2	2.2	6	8.1	3	7.4
1977	140	100.0	5	3.4	57	40.7	26	18.8	14	10.1	13	9.1	4	3.1	10	6.9	2	1.2
1978	267	100.0	21	8.0	73	27.1	50	18.8	17	6.3	37	13.7	7	2.5	56	20.9	2	0.6
1979	243	100.0	7	2.7	58	24.1	23	9.4	17	7.1	52	21.5	6	2.3	72	29.7	2	1.0
1980	126	100.0	3	2.7	24	19.2	4	2.8	7	5.8	36	28.8	5	3.6	34	27.3	(c)	0.1
Yugoslavia																		
1974	47	100.0	1	2.0	28	60.0	(c)	13.6	6	13.7	6	1.4	1	5.3	2	.7	(c)	1.2
1975	85	100.0	2	1.8	53	61.9	(c)	(d)	9	10.5	9	11.1	1	1.3	8	9.8	1	.6
1976	68	100.0	2	3.2	39	57.6	NA	NA	11	16.4	6	8.1	2	2.9	5	7.1	2	2.6
1977	87	100.0	2	1.8	57	65.7	NA	NA	11	13.0	8	9.6	3	3.5	3	3.4	1	1.5
1978	143	100.0	5	3.6	83	58.4	NA	NA	22	15.5	15	10.3	5	3.3	6	4.5	3	2.4
1979	186	100.0	5	2.7	98	52.5	8	4.2	22	11.9	24	12.9	2	1.2	14	7.5	(c)	0.5
1980	139	100.0	3	2.2	66	47.6	NA	NA	17	12.1	31	22.4	4	2.8	14	10.1	2	1.3
Czechoslovakia																		
1974	33	100.0	(c)	.2	20	59.6	(c)	.1	8	24.2	1	3.0	1	2.2	1	3.7	1	1.7
1975	51	100.0	(c)	(d)	30	59.2	(c)	.6	7	13.9	2	4.2	1	1.6	2	4.6	1	1.9
1976	57	100.0	(c)	.8	26	44.9	(c)	.2	11	18.8	2	4.2	4	6.4	8	14.5	1	1.1
1977	53	100.0	(c)	.9	34	63.5	2	3.0	8	15.2	3	5.4	1	2.7	1	1.3	(c)	.3
1978	75	100.0	(c)	0.3	49	64.3	NA	NA	12	15.8	6	7.3	2	2.0	2	3.1	1	0.8
1979	82	100.0	NA	NA	54	65.8	1	0.6	17	20.8	3	4.0	1	1.2	1	1.7	3	3.2
1980	78	100.0	NA	NA	44	56.1	NA	NA	11	13.7	11	14.6	3	3.4	4	5.6	(c)	0.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Hungary																		
1974	$12	100.0%	(c)	.2%	$ 7	53.5%	$1	5.6%	$2	20.3%	(c)	2.3%	(c)	3.2%	$1	4.5%	(c)	.8%
1975	15	100.0	(c)	.4	9	57.8	(c)	(d)	3	22.4	$1	9.4	(c)	2.7	1	4.4	(c)	1.6
1976	27	100.0	(c)	.6	13	48.4	(c)	.1	5	19.2	5	18.5	(c)	1.4	1	2.9	$1	4.4
1977	50	100.0	$2	3.4	32	63.6	3	7.0	5	10.4	1	2.0	$1	1.7	1	1.9	1	1.6
1978	48	100.0	(c)	0.4	26	55.3	1	1.9	7	15.3	4	9.2	1	1.4	2	5.0	NA	NA
1979	62	100.0	1	1.6	44	70.9	NA	NA	6	9.1	3	4.3	NA	NA	2	3.1	1	1.5
1980	41	100.0	NA	NA	22	53.3	NA	NA	7	16.2	3	8.3	1	3.4	2	4.5	(c)	0.9

NA - Not Available.

(a) Re-exported items are included; therefore these figures are inconsistent with other Handbook data.

(b) Percent of Total is proportion of Total Exports from 14 Major Producers. The 14 countries are: United States, Austria, Belgium, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.

(c) Less than $500,000.

(d) Less than .05%.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools for Working Metals.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL CUTTING						
01	For fissionable material, NC	$ 296	$ —	$ —	$ 140	$ 141	$ —
03	For fissionable material, not NC	189	—	7	142	38	—
05	Electro erosion, electric, ultrasonic, NC	47,764	22,692	8,989	8,564	2,486	4,039
07	Electro erosion, electric, ultrasonic, not NC	27,113	6,472	7,246	9,299	1,045	2,127
12	Center and copying multiple tool lathes, NC	80,037	22,044	14,909	4,381	17,560	18,059
14	Automatic and turret lathes, NC	78,433	13,951	19,959	4,357	7,441	28,585
16	Automatic and revolving lathes, not parallel, multiple tool, NC	59,267	10,425	13,635	6,494	6,071	19,580
22	Center and copying lathes, multiple tool, not NC	46,716	18,305	8,360	3,255	5,411	8,988
24	Automatic and turret lathes, not NC	64,007	14,904	20,900	9,878	3,063	14,011
26	Automatic and turret lathes, not parallel, multiple tool, not NC	33,295	9,931	5,189	5,915	7,674	—
36	Boring-milling machines, horizontal, NC	61,214	25,966	11,974	4,226	4,284	12,317
37	Boring machines, not boring-milling, NC	10,979	2,811	3,828	493	716	3,085
38	Boring-milling, horizontal, not NC	17,503	5,083	3,294	1,288	1,977	4,435
39	Boring machines, not boring-milling, not NC	15,596	3,257	6,722	1,834	1,424	2,094
41	Planing machines, NC	304	61	139	8	39	—
43	Planing machines, not NC	1,328	302	421	91	151	143
44	Shaping & slotting, broaching, sawing, NC	3,356	730	1,833	336	2	58
45	Shaping & Slotting, not NC	3,983	224	582	352	407	1,384
46	Broaching machines, not NC	10,225	983	4,412	12	76	4,708
47	Sawing and cut-off machines, not NC	49,981	8,382	12,157	7,219	6,779	10,842
48	Milling machines, NC	88,067	21,652	23,631	7,823	12,035	19,487
49	Radial drilling machines, NC	1,758	356	209	306	158	451
51	Piercing machines, not drilling, NC	42,926	9,702	17,752	3,608	6,547	3,952
52	Milling machines, not NC	110,805	33,609	24,909	15,014	11,768	20,829
53	Radial drilling machines, not NC	8,760	3,118	1,544	1,392	1,360	1,068
54	Other drilling machines	46,563	13,519	14,639	1,821	7,000	5,969
55	Cylindrical and surface grinding machines (micrometric) NC	31,589	4,756	7,497	10,424	1,980	5,811
56	Grinding, honing, polishing, lapping (micrometric), NC	6,507	3,401	654	227	1,137	633
57	Surface grinding machines, plane surface (micrometric), not NC	24,137	3,749	6,046	1,520	2,984	8,217
58	Surface grinding machines, cylindrical surface (micrometric), not NC	45,336	16,811	11,887	1,948	2,576	10,988
59	Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	52,710	16,149	11,078	9,874	3,189	9,669
61	Grinding, honing, polishing, lapping, (micrometric), not NC	35,225	15,551	7,389	4,077	1,890	5,258
62	Grinding, honing, polishing, lapping (not micrometric), NC	5,287	1,584	2,695	332	251	75
63	Grinding, honing, polishing, lapping (not micrometric), not NC	50,207	13,544	17,684	6,425	7,150	2,722
64	Jig boring & milling machines, NC	37,767	11,867	5,589	2,414	14,725	1,727
65	Jig boring & milling machines, not NC	6,738	2,889	770	1,075	440	1,348
66	Gear cutting machines, cylindrical, NC	1,921	295	693	154	4	753
68	Gear cutting machines, cylindrical, not NC	11,994	1,149	4,563	2,178	2,080	1,938
69	Gear cutting machines, noncylindrical, NC	3,906	163	153	351	953	2,287
71	Gear cutting machines, noncylindrical, not NC	14,762	7,278	2,392	2,921	768	1,141
93	Screwing and tapping machines by cutting	16,481	2,951	3,433	3,678	1,982	3,790
94	Other metal cutting machines	132,877	3,338	38,795	978	1,154	87,110
	Total imports, cutting (EEC)	$1,387,909	$353,964	$348,558	$146,824	$148,916	$329,678

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 9,314	$ 1,763	$ 1,108	$ 367	$ 3,154	$ 2,052
75 Presses, NC, other than 8445.81, 82, 88	9,988	516	897	2,020	537	4,422
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	32,907	8,741	6,737	2,481	3,340	9,188
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	13,841	4,435	3,065	1,253	957	3,301
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	54,249	7,795	20,860	12,789	6,285	4,337
81 Rolling, bending, folding and planing machines, NC	20,498	5,480	4,555	1,223	3,241	2,818
82 Shearing, punching and stamping, NC	47,371	2,958	19,789	2,713	6,954	11,553
83 Rolling, bending, folding and planing machines, not NC	37,501	15,981	4,551	3,698	5,223	5,757
84 Rolling, bending, folding and planing, not flat products, not NC	32,925	8,257	8,164	2,613	5,127	6,129
85 Hydraulic shearing machines, not NC	21,028	8,429	5,141	848	2,442	3,259
86 Nonhydraulic shearing machines, not NC	15,033	2,881	4,013	2,364	2,952	2,059
87 Punching and stamping machines, not NC	17,458	4,535	3,757	893	4,331	2,587
88 Forging and stamping, NC	170	—	—	37	54	—
89 Forging and stamping, not NG	14,753	1,266	7,652	2,454	1,581	1,636
92 Forming by drawing, bare, tubes, wire etc.	9,259	1,424	757	2,125	1,984	2,809
95 Screwing and tapping machines not by cutting	4,928	2,142	1,004	582	164	898
96 Other metal forming machines for working flat products	8,048	1,391	2,135	500	999	2,349
97 Other machines for working wire	25,024	7,221	7,116	1,305	2,616	4,939
Total imports, forming (EEC)	$ 374,295	$ 85,215	$101,301	$ 40,265	$ 51,941	$ 70,093
98 MACHINE TOOLS NEC	94,312	15,625	30,013	21,700	11,822	8,426
Grand Total	$1,856,516	$454,804	$479,872	$208,789	$212,679	$408,197

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Comunities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL CUTTING						
01	For fissionable material, NC	$ 9	$ —	$ 6	$ —	$ 3	$ —
03	For fissionable material, not NC	64	52	—	1	11	—
05	Electro erosion, electric, ultrasonic, NC	18,800	7,855	2,826	445	641	6,941
07	Electro erosion, electric, ultrasonic, not NC	20,742	13,362	469	522	275	5,996
12	Center and copying multiple tool lathes, NC	94,916	64,739	2,052	5,401	14,649	7,904
14	Automatic and turret lathes, NC	140,734	101,062	12,826	3,580	10,109	13,098
16	Automatic and revolving lathes, not parallel, multiple tool, NC	85,931	44,058	4,703	24,211	1,482	11,282
22	Center and copying lathes, multiple tool, not NC	97,608	38,369	10,051	9,316	4,648	35,134
24	Automatic and turret lathes, not NC	143,702	82,905	6,267	17,494	551	36,278
26	Automatic and turret lathes, not parallel, multiple tool, not NC	67,587	32,912	11,479	18,882	3,471	—
36	Boring-milling machines, horizontal, NC	94,223	47,315	2,834	20,116	7,761	13,998
37	Boring machines, not boring-milling, NC	15,933	4,806	—	1,271	6,487	3,319
38	Boring-milling, horizontal, not NC	23,927	8,800	3,211	4,436	513	5,730
39	Boring machines, not boring-milling, not NC	41,636	19,069	3,330	12,886	925	3,780
41	Planing machines, NC	1,227	957	9	245	16	—
43	Planing machines, not NC	4,660	2,785	624	876	148	225
44	Shaping & slotting, broaching, sawing, NC	3,867	1,060	1,445	960	—	402
45	Shaping & Slotting, not NC	7,449	3,376	302	1,683	72	1,972
46	Broaching machines, not NC	27,074	15,538	275	3,432	40	7,725
47	Sawing and cut-off machines, not NC	102,984	60,657	10,850	21,245	3,264	6,204
48	Milling machines, NC	147,748	91,998	18,423	23,849	1,949	11,241
49	Radial drilling machines, NC	5,673	1,289	82	3,936	30	53
51	Piercing machines, not drilling, NC	39,681	14,771	2,449	17,141	1,124	4,094
52	Milling machines, not NC	223,166	111,917	23,043	33,564	3,060	50,274
53	Radial drilling machines, not NC	8,961	2,106	492	4,222	332	1,716
54	Other drilling machines	67,189	27,635	6,794	13,163	2,879	15,215
55	Cylindrical and surface grinding machines (micrometric) NC	57,043	30,471	1,907	9,897	243	14,385
56	Grinding, honing, polishing, lapping (micrometric), NC	23,077	17,234	—	2,567	988	2,216
57	Surface grinding machines, plane surface (micrometric), not NC	83,365	56,036	2,430	7,213	481	12,950
58	Surface grinding machines, cylindrical surface (micrometric), not NC	107,073	66,471	2,729	2,323	487	27,788
59	Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	89,944	38,436	6,588	26,037	8,854	9,787
61	Grinding, honing, polishing, lapping, (micrometric), not NC	121,729	90,659	12,383	10,560	616	7,270
62	Grinding, honing, polishing, lapping (not micrometric), NC	4,387	1,569	2,534	121	151	—
63	Grinding, honing, polishing, lapping (not micrometric), not NC	83,486	41,888	10,225	19,443	6,562	1,423
64	Jig boring & milling machines, NC	42,068	14,892	66	14,467	12,625	—
65	Jig boring & milling machines, not NC	8,193	2,757	177	1,532	162	3,557
66	Gearcutting machines, cylindrical, NC	6,773	6,405	—	12	33	259
68	Gear cutting machines, cylindrical, not NC	42,208	34,047	109	403	16	7,552
69	Gear cutting machines, noncylindrical, NC	1,977	1,281	—	267	—	428
71	Gear cutting machines, noncylindrical, not NC	35,207	26,684	993	2,345	2,505	2,659
93	Screwing and tapping machines by cutting	26,141	10,780	2,021	2,798	2,196	3,760
94	Other metal cutting machines	281,792	197,356	16,590	45,345	203	22,167
	Total exports, cutting (EEC)	$2,499,954	$1,436,359	$183,594	$388,207	$100,562	$358,782

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1982

(Thousands of U.S. Dollars)

(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 10,700	$ 3,795	$ 6	$ 2,502	$ 565	$ 3,610
75 Presses, NC, other than 8445.81, 82, 88	13,829	5,210	—	3,776	2,650	2,084
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	108,250	70,154	3,892	5,963	12,582	11,878
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	38,950	28,142	965	2,093	5,226	2,523
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	189,770	114,094	23,520	33,203	10,219	8,299
81 Rolling, bending, folding and planing machines, NC	23,961	7,122	2,686	3,336	2,632	6,924
82 Shearing, punching and stamping, NC	70,123	53,765	2,348	6,078	2,096	4,776
83 Rolling, bending, folding and planing machines, not NC	83,211	48,643	4,756	12,785	7,568	5,958
84 Rolling, bending, folding and planing, not flat products, not NC	90,157	32,504	14,220	19,387	10,135	12,045
85 Hydreulic shearing machines, not NC	44,933	18,623	6,658	1,379	10,651	3,640
86 Nonhydraulic shearing machines, not NC	62,513	35,227	3,064	16,720	1,085	5,314
87 Punching and stamping machines, not NC	23,923	9,584	2,741	3,184	5,256	2,213
88 Forging and stamping, NC	8,619	8,313	—	82	223	—
89 Forging and stamping, not NG	52,427	35,339	3,675	3,758	1,094	8,414
92 Forming by drawing, bare, tubes, wire etc.	70,169	53,271	1,674	7,319	438	7,433
95 Screwing and tapping machines not by cutting	9,755	6,827	799	1,158	300	619
96 Other metal forming machines for working flat products	36,462	30,813	1,267	2,746	280	1,293
97 Other machines for working wire	75,021	57,157	7,160	3,010	3,813	3,444
Total exports, forming (EEC)	$1,012,773	$ 618,583	$ 79,411	$128,479	$ 76,815	$ 90,467
98 MACHINE TOOLS NEC	237,131	49,459	32,400	124,891	5,996	23,180
Grand Total	$3,749,858	$2,104,401	$295,405	$641,577	$183,373	$472,429

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

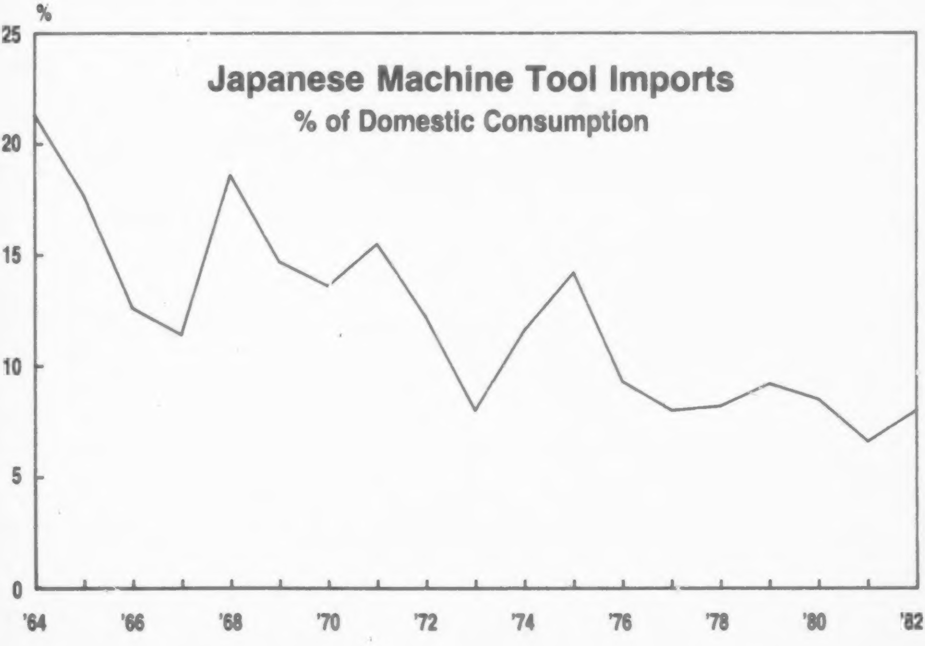
MACHINE TOOL IMPORTS AS A PERCENT OF DOMESTIC MACHINE TOOL CONSUMPTION, 1964 TO DATE

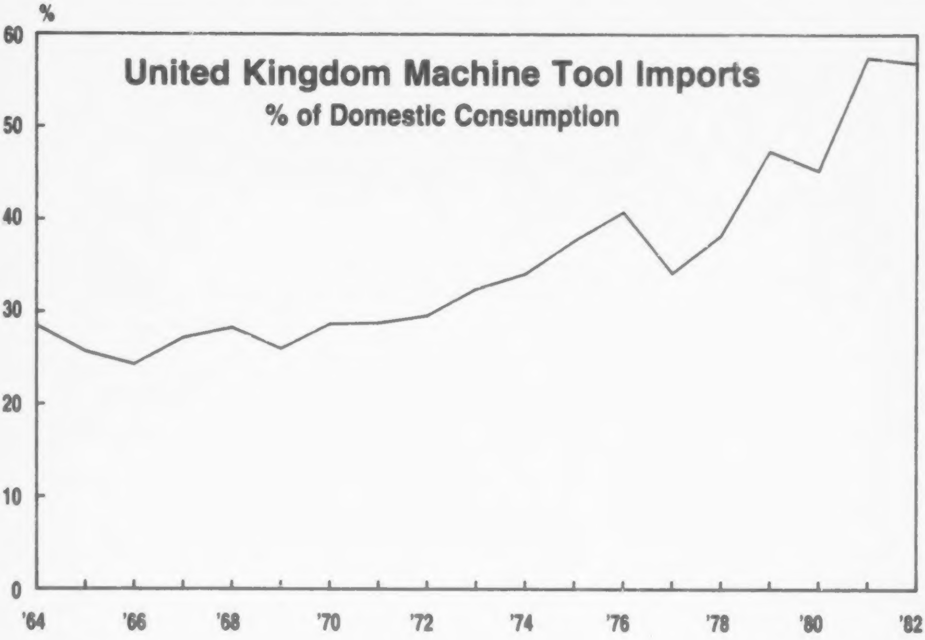
(Percent)

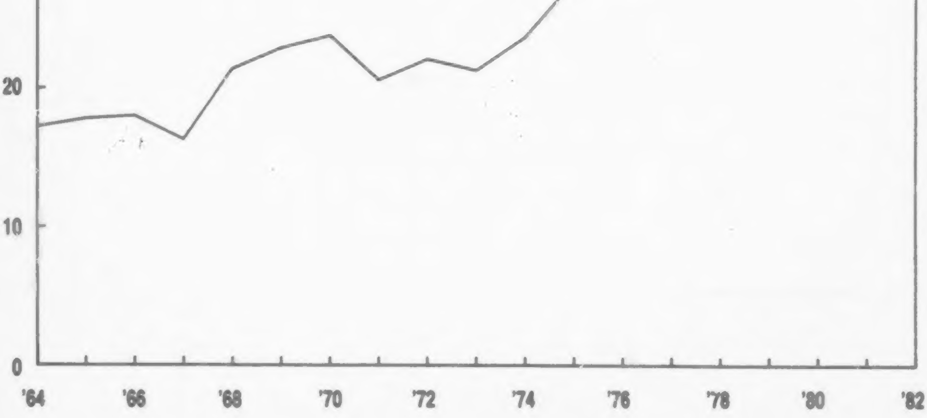
Year	U.S.A.	Japan	United Kingdom	West Germany
1964	3.5%	21.3%	28.5%	17.2%
1965	4.2	17.7	25.7	17.8
1966	7.1	12.6	24.3	18.0
1967	9.6	11.4	27.2	16.3
1968	9.6	18.6	28.3	21.4
1969	9.4	14.7	26.0	22.9
1970	9.1	13.6	28.7	23.8
1971	9.4	15.5	28.8	20.6
1972	9.4	12.2	29.6	22.1
1973	9.7	8.0	32.5	21.3
1974	12.7	11.6	34.1	23.7
1975	13.8	14.2	37.7	27.8
1976	14.9	9.3	40.8	27.7
1977	15.6	8.0	34.2	30.0
1978	21.3	8.2	38.3	29.9
1979	22.2	9.2	47.4	29.8
1980	23.2	8.5	45.3	32.8
1981(r)	24.4	6.6	57.5	28.4
1982	26.8	8.0	56.9	30.1

r - Revised.

Source: National Machine Tool Builders' Association and respective machine tool trade associations.




United Kingdom Machine Tool Imports
% of Domestic Consumption

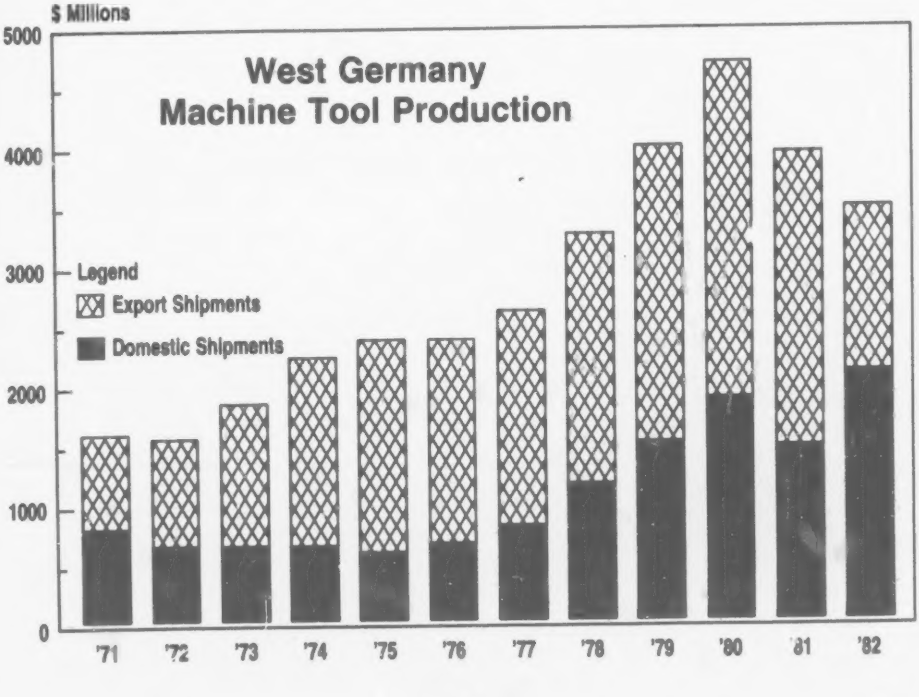

West German Machine Tool Imports
% of Domestic Consumption

THE GERMAN MACHINE TOOL INDUSTRY (a)
1964 to Date

Year	Employees (Year-End)	Per Cent of Production Exported	Imports as Per Cent of Exports	Production Per Employee
		Per Cent of Value		U.S. $
1964	110,000	51.5%	19.6%	$ 6,856
1965	115,000	47.3	24.2	7,564
1966	112,500	54.9	18.0	7,800
1967	108,000	62.9	11.5	7,943
1968	110,000	68.3	12.6	8,069
1969	120,000	59.1	20.6	9,869
1971	120,000	49.3	26.7	15,370
1972	113,000	55.7	21.2	15,896
1973	112,000	61.3	15.8	19,403
1974	111,500	69.0	12.8	23,411
1975	102,000	75.5	13.2	26,973
1976	96,500	72.0	14.9	28,521
1977	99,000	69.8	18.7	31,456
1978	98,700	64.7	22.9	38,723
1979	100,000	61.9	26.1	46,909
1980	99,000	62.5	29.2	54,937
1981	99,000	65.7	26.0	45,911
1982	94,600	64.2	24.1	42,643

(a) Figures include parts.

Sources: VDMA, "Statistisches Handbuch für den Maschinenbau", annually, "Die Lage des Maschinenbaues im Jahre," annually, and official foreign trade statistics.



GERMAN PRODUCTION OF MACHINE TOOLS

1979 to Date

(Values in Thousands of U.S. Dollars)

Machine Classifications	1979		1980		1981		1982	
	Units	Value	Units	Value	Units	Value	Units	Value
GRAND TOTAL	223,337	$4,690,942	233,831	$5,438,742	216,778	$4,545,215	184,967	$4,034,050
Metal Cutting Total	121,628	$3,202,474	138,655	$3,770,976	121,471	$3,145,718	89,461	$2,763,248
Planing, Slotting and Broaching	2,420	53,320	886	45,317	896	52,257	658	42,134
Lathes	9,238	405,187	10,320	419,965	9,969	366,585	7,263	292,209
Turret Lathes, Automatic	4,430	381,915	4,562	465,188	3,801	380,690	2,855	307,676
Drilling	20,777	168,839	21,387	200,751	18,916	132,359	13,707	111,526
Milling Machines, Horizontal Boring and Milling Machines	8,446	422,049	9,115	551,649	8,568	503,112	6,831	410,129
Saws and Filing Machines	20,060	110,021	20,575	127,556	18,312	103,284	14,761	87,414
Grinding, Honing and Polishing	41,714	499,101	55,912	570,244	45,998	478,880	29,926	447,968
Gear Cutting Machines	1,106	138,963	1,240	159,065	1,337	142,610	1,043	121,130
Other Metal Cutting Machine Tools	13,437	591,901	14,658	766,381	13,674	614,377	12,417	605,704
Parts and Accessories	—	431,158	—	464,861	—	371,566	—	337,358
Metal Forming Total	101,709	1,488,468	95,176	1,667,766	95,307	1,399,498	95,506	1,270,802
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	9,970	145,583	6,764	167,908	5,882	150,042	5,425	134,807
Mechanical Presses	10,302	235,960	9,018	295,522	8,203	252,339	9,437	193,607
Hydraulic Presses	2,484	262,853	2,466	268,862	2,095	215,548	2,113	230,467
Sheet Metalworking Machines, Including Shears	70,341	273,319	67,334	311,890	70,999	292,365	71,671	288,854
Wire Working Machines	7,675	225,043	8,670	253,970	7,171	211,965	6,409	198,912
Bolt, Screw and Nut Making Machines	937	94,020	924	102,754	957	57,010	451	30,313
Parts and Accessories	—	251,690	—	266,859	—	220,227	—	191,842

Notes: German Federal Republic includes West Berlin. Totals include some unclassified items.

Exchange Rate: 1979 $1 = 1.83 Deutsche Mark; 1980 $1 = 1.818 Deutsche Mark: 1981 $1 = 2.260 Deutsche Mark, 1982 $1 = 2.4266 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Fachgemeinschaft Werkzeugmaschinen, from official foreign trade statistics.

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF MACHINE TOOLS

1980 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	183,649	$3,401,935	201,518	$2,982,722	182,980	$2,587,957
Metal Cutting Total	152,384	$2,177,178	169,747	$1,888,900	152,714	$1,624,741
Planing, Slotting and Broaching	494	29,509	485	25,710	411	22,644
Lathes	3,463	268,621	3,535	231,368	3,941	179,976
Turret Lathes, Automatic	3,729	254,975	3,198	215,613	2,623	183,861
Drilling	5,988	96,701	7,306	82,764	6,522	87,275
Milling Machines, Horizontal Boring and Milling Machines	6,349	353,143	6,774	320,734	5,822	259,878
Saws and Filing Machines	15,021	80,968	15,367	69,137	10,459	61,681
Grinding, Honing and Polishing	111,291	423,600	126,983	358,304	117,637	342,567
Gear Cutting Machines	943	96,985	867	82,243	610	68,378
Other Metal Cutting Machine Tools	5,106	342,965	5,210	298,649	4,689	229,221
Parts and Accessories	—	218,711	—	204,379	—	189,259
Metal Forming Total	29,085	1,017,529	29,278	925,524	27,324	853,136
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	2,699	117,751	3,523	97,775	3,468	88,347
Mechanical Presses	3,226	109,482	3,001	163,621	3,026	118,971
Hydraulic Presses	1,550	114,960	1,796	67,457	1,347	71,242
Sheet Metalworking Machines, Including Shears	11,380	217,454	10,241	188,273	9,453	177,613
Wire Working Machines	4,619	165,392	5,103	150,044	5,035	150,257
Bolt, Screw and Nut Making Machines	617	65,955	673	48,083	580	37,612
Other Metal Forming Machine Tools	4,994	48,086	4,941	48,995	4,415	49,433
Parts and Accessories	—	178,429	—	161,277	—	159,660
Other Metal Working Machines (including Parts and Accessories)	2,160	207,228	2,493	168,299	2,942	110,080

Exchange rate: 1980 $1 = 1.818 Deutsche Mark; 1981 $1 = 2.260 Deutsche Mark; 1982 $1 = 2.4266 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN IMPORTS OF MACHINE TOOLS
1980 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	122,711	$993,994	76,724	$774,776	59,703	$622,904
Metal Cutting Total	101,202	$675,184	58,159	$519,960	42,217	$415,089
Planing, Shaping and Broaching	279	5,348	153	1,264	108	1,569
Lathes	9,994	118,888	8,692	87,114	5,659	60,670
Turret Lathes, Automatic	1,595	70,162	1,040	42,376	683	28,838
Drilling	20,380	81,152	7,467	58,249	6,287	47,560
Milling Machines, Horizontal Boring and Milling Machines	5,791	123,894	4,586	115,373	4,077	86,192
Saws and Filing Machines	7,619	13,996	9,723	11,722	6,321	9,107
Grinding, Honing and Polishing	51,563	120,352	23,643	88,740	16,432	75,631
Gear Gutting Machines	124	12,757	114	8,847	66	8,880
Other Metal Cutting Machine Tools	3,857	44,218	2,741	35,600	2,584	35,432
Parts and Accessories	—	84,417	—	70,675	—	61,210
Metal Forming Total	16,866	273,067	14,992	219,450	12,028	176,356
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	2,528	14,260	2,343	20,338	1,356	9,841
Mechanical Presses	2,527	28,325	2,105	15,514	1,673	8,305
Hydraulic Presses	1,309	20,954	1,610	14,274	1,056	9,034
Sheet Metalworking Machines, Including Shears	4,103	50,968	3,732	39,720	3,199	38,807
Wire Working Machines	2,322	40,853	2,028	29,454	1,674	26,128
Bolt, Screw and Nut Making Machines	327	9,796	295	10,938	217	8,036
Other Metal Forming Machine Tools	3,750	20,459	2,879	18,302	2,853	15,616
Parts and Accessories	—	67,452	—	70,909	—	60,590
Other Metal Working Machines (including Parts and Accessories)	4,643	45,743	3,573	35,365	5,458	31,459

Exchange rate: 1980 $1 = 1.818 Deutsche Mark; 1981 $1 = 2.260 Deutsche Mark; 1982 $1 = 2.4266 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1982
(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$1,435,482	$87,275	$68,378	$342,567	$183,861	$179,976	$259,878	$61,681	$22,644	$229,221
EUROPE	995,592	66,784	40,943	211,899	143,856	121,003	190,509	42,296	14,096	164,205
France	119,875	9,561	5,112	22,870	23,771	7,601	18,145	8,176	1,547	23,092
Belgium-Luxembourg	29,993	3,948	1,297	5,138	3,724	4,935	6,411	2,555	196	1,788
Netherlands	34,064	4,588	616	7,200	3,322	3,851	10,452	2,350	143	1,541
Italy	62,152	1,658	5,688	15,684	7,370	4,805	12,930	3,776	195	10,045
United Kingdom	91,659	5,131	1,582	13,284	13,821	10,247	22,245	5,682	1,156	18,511
Denmark	9,963	476	215	1,165	2,032	1,386	1,582	1,449	—	1,659
Norway	6,666	216	188	853	813	594	941	2,385	10	665
Sweden	50,545	2,801	3,664	11,125	6,764	6,702	9,729	3,072	527	6,161
Switzerland	67,993	6,596	2,330	11,824	8,907	8,721	19,489	3,124	400	6,601
Austria	104,301	6,963	3,444	15,627	8,984	8,741	16,842	2,589	2,367	38,744
Portugal	13,898	19	363	2,229	630	5,303	2,889	419	1,514	533
Spain	43,732	1,116	2,551	5,715	6,516	3,854	5,703	799	1,388	16,090
Yugoslavia	40,679	5,701	2,686	8,069	9,880	4,020	4,905	722	370	4,325
U.S.S.R.	188,385	8,381	7,595	61,411	27,199	32,540	29,105	1,337	2,727	18,090
Poland	49,804	2,208	1,360	4,876	10,685	11,394	14,713	37	307	4,224
Czechoslovakia	14,958	1,074	216	9,108	220	349	2,225	867	33	867
Hungary	7,780	512	954	1,528	126	1,487	951	9	476	1,737
Bulgaria	21,484	4,391	264	5,878	4,319	1,406	4,420	273	317	216
Romania	2,332	17	—	396	951	86	—	47	—	835
AFRICA	64,025	6,337	926	15,707	3,046	11,067	9,937	2,960	1,904	12,140
Rep. South Africa	45,684	5,558	519	11,373	2,657	4,568	8,214	1,950	1,565	9,280
AMERICA	205,108	8,114	13,544	54,580	25,182	24,732	34,576	7,484	4,796	32,099
United States	126,477	4,069	10,818	34,015	15,223	13,381	21,700	4,928	4,262	18,081
Canada	10,551	472	33	2,807	1,334	3,268	885	1,041	70	641
Mexico	33,273	756	920	6,827	5,825	2,611	3,951	786	81	11,514
Venezuela	2,544	5	210	900	159	548	127	79	317	198
Brazil	20,849	2,426	1,235	7,241	2,302	3,677	2,882	314	22	750
Chile	686	21	—	141	12	369	72	4	2	66
Argentina	7,251	326	89	1,373	310	455	4,372	223	—	104
ASIA	157,077	5,385	12,165	57,149	10,460	19,808	22,951	7,561	1,831	19,766
Iraq	14,150	1,193	—	1,571	476	7,338	2,373	421	240	538
Israel	5,393	99	147	1,282	596	401	1.642	233	24	969
Other Near East	11,921	1,157	6	2,848	1,198	1,651	1,447	1,439	352	1,823
India	31,326	1,534	2,305	12,581	2,728	4,027	4,969	989	144	2,047
Indonesia	3,781	102	21	749	193	589	1,432	261	40	394
Singapore	3,837	102	—	870	397	557	1,175	445	19	272
China	7,007	9	289	3,029	1,260	1,699	54	638	—	29
Japan	50,149	288	6,132	24,215	1,354	374	4,566	2,169	—	11,050
Taiwan	10,906	13	2,326	4,116	40	1,670	383	454	528	1,377
AUSTRALIA/OCEAN	13,680	654	799	3,232	1,317	3,366	1,905	1,380	17	1,010
Australia	12,677	572	799	2,923	1,035	3,342	1,837	1,150	17	1,001

Exchange Rate: $1 = 2.4266 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN EXPORTS OF METAL FORMING MACHINE TOOLS
By Type of Machine & By Destination, 1982
(Thousands of U.S. Dollars)

Country of Destination	Total (a)	Hammers, Forging & Riveting, Bending, & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$693,476	$88,347	$118,971	$71,242	$177,613	$150,257	$37,612	$49,433
EUROPE	427,247	54,808	78,344	46,118	114,803	78,616	21,268	33,290
France	51,020	6,335	7,541	5,322	14,649	8,052	5,349	3,772
Belgium-Luxembourg	14,912	869	1,372	569	7,733	3,320	74	975
Netherlands	13,865	1,858	1,700	745	5,275	2,063	409	1,816
Italy	28,594	3,964	3,702	4,328	10,228	3,331	1,169	1,873
United Kingdom	35,520	1,659	3,865	5,933	9,728	8,450	2,499	3,385
Denmark	6,714	422	1,425	1,207	2,075	874	224	485
Norway	7,893	2,200	221	145	4,161	914	127	124
Sweden	13,427	539	1,013	2,625	5,321	2,104	282	1,542
Switzerland	32,645	1,422	3,575	3,720	11,476	8,045	1,542	2,865
Austria	35,103	9,041	8,476	3,851	5,760	4,268	1,359	4,348
Portugal	6,729	116	298	984	560	3,262	248	1,260
Spain	23,267	2,972	11,088	634	4,546	2,312	219	1,496
Yugoslavia	13,081	1,378	1,203	1,400	3,863	3,940	358	938
U.S.S.R.	59,273	8,835	19,109	3,703	15,164	5,816	1,997	4,650
Poland	25,315	2,424	6,615	2,429	2,396	5,854	3,643	1,954
Czechoslovakia	6,198	48	497	342	2,309	2,475	82	445
Hungary	3,359	305	450	136	1,657	582	1	228
Romania	220	—	—	—	7	25	181	6
Bulgaria	19,834	6,623	5,721	4,030	1,535	1,495	405	23
AFRICA	48,968	3,688	9,664	3,465	11,114	16,777	1,411	2,849
Rep. South Africa	21,751	785	6,688	886	4,794	6,115	1,022	1,460
AMERICA	105,884	16,554	16,983	9,353	29,495	20,324	8,341	4,833
United States	53,500	7,920	7,137	6,320	15,520	8,243	6,084	2,276
Canada	9,734	3,912	1,052	143	1,135	1,034	2,026	432
Mexico	24,409	2,311	7,188	1,085	6,708	6,474	78	565
Venezuela	3,906	35	949	771	574	1,429	47	102
Brazil	7,062	129	308	461	4,059	842	97	1,165
Chile	793	24	12	—	595	162	—	—
Argentina	2,147	1,700	41	—	230	138	9	30
ASIA	99,472	11,059	13,317	11,295	20,584	30,564	5,265	7,389
Iraq	8,629	1,034	136	223	4,383	2,454	169	229
Israel	2,130	148	312	303	574	541	188	63
Other Near East	20,636	2,227	1,498	498	4,066	11,396	218	733
India	22,705	3,843	4,641	6,799	1,977	1,593	2,178	1,674
Indonesia	5,383	147	415	163	1,842	1,900	52	865
Singapore	6,099	258	277	354	1,966	1,433	677	1,136
People's Rep. China	1,776	126	503	—	7	1,136	—	5
Japan	13,450	1,764	3,586	936	1,917	2,583	1,652	1,013
Taiwan	4,550	601	5	40	3,192	482	23	208
AUSTRALIA & PACIFIC	11,906	2,239	663	1,011	1,617	3,977	1,327	1,072
Australia	10,941	2,155	656	1,011	1,429	3,328	1,327	1,034

Exchange Rate: $1 = 2.4266 Deutsche Mark.

(a) Includes other metalworking machines.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine & By Destination, 1982

(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$353,880	$47,560	$8,880	$75,631	$28,838	$60,670	$86,192	$9,107	$1,569	$35,432
EUROPE										
France	15,687	1,296	16	1,789	3,826	987	5,682	668	172	1,252
Belgium-Luxembourg	14,254	1,662	183	461	1,234	5,098	5,311	13	45	247
Netherlands	6,589	303	91	3,541	148	617	1,280	369	14	225
Italy	38,605	4,836	63	7,387	2,583	7,793	12,909	1,550	543	940
United Kingdom	13,775	1,115	497	5,589	814	2,026	2,967	97	401	269
Denmark	1,898	379	28	661	16	57	565	46	—	145
Sweden	8,458	698	—	3,699	1,907	530	1,472	52	—	100
Switzerland	125,120	17,727	2,616	36,649	8,265	10,893	25,338	1,231	98	22,302
Austria	19,078	3,832	14	5,756	451	5,802	2,383	573	47	160
Spain	8,587	1,087	—	470	268	1,552	4,416	463	149	182
Yugoslavia	2,868	—	—	461	354	62	1,991	—	—	—
U.S.S.R.	2,507	192	32	314	249	534	1,159	18	8	—
Poland	1,352	160	—	199	70	545	300	78	—	—
Czechoslovakia	5,668	231	202	631	98	992	3,487	—	27	—
Hungary	6,094	1,311	—	73	222	2,580	1,901	—	7	—
Romania	3,063	343	—	410	—	2,002	261	2	45	—
Other Europe	2,814	228	2	99	11	1,448	221	448	—	356
United States	15,572	1,231	4,956	4,592	[illegible]	195	1,341	320	—	1,481
Japan	52,896	8,400	—	854	6,178	14,559	12,220	2,982	—	7,703
All Other Countries	8,995	2,466	177	1,997	689	2,398	990	196	12	70

Exchange Rate: $1 = 2.4266 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL FORMING MACHINE TOOLS
By Type of Machine & By Destination, 1982
(Thousands of U.S. Dollars)

Origin	Total (a)	Hammers, Forging & Riveting, Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$115,766	$9,841	$8,305	$9,034	$38,807	$26,128	$8,036	$15,616
EUROPE								
France	12,600	898	724	1,546	4,337	2,376	279	2,439
Belgium-Lux	5,561	320	676	1,027	2,087	753	490	208
Netherlands	8,067	1,908	80	1,347	3,623	418	103	588
Italy	14,840	2,494	1,164	414	2,861	3,297	2,494	2,116
United Kingdom	4,683	518	330	730	1,221	652	681	552
Denmark	2,124	130	174	483	1,220	62	19	36
Sweden	2,721	128	128	287	1,106	924	51	97
Switzerland	27,644	959	1,510	2,452	10,554	7,193	1,698	3,278
Austria	3,977	797	110	113	705	1,760	16	476
Spain	3,372	55	240	16	233	2,579	44	205
Yugoslavia	188	40	148	—	—	—	—	—
U.S.S.R.	312	26	276	—	11	—	—	—
Poland	112	—	—	—	30	81	—	—
Czechoslovakia	1,428	535	732	—	162	—	—	—
Hungary	321	—	59	—	30	233	—	—
Romania	272	—	—	41	231	—	—	—
Other Europe	1,315	3	4	213	334	623	—	138
United States	18,569	739	860	112	8,036	3,166	572	5,085
Japan	4,666	42	991	4	1,870	339	1,111	309
All Other Countries	2,993	251	99	249	155	1,671	478	89

NA - Not Available. Exchange Rate: $1 = 2.4266 Deutsche Mark.

(a) Totals for individual countries exclude other metalworking machinery and exclude parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

JAPANESE PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF METAL CUTTING MACHINE TOOLS, 1963 to Date

(Millions of U.S. Dollars)

	Production	Imports	Exports	Domestic Consumption
1963	$ 264.3	$ 63.3	$ 11.9	$ 315.7
1964	252.5	59.2	18.1	293.7
1965	195.4	38.8	24.8	209.4
1966	212.4	21.1	40.6	192.9
1967	350.1	35.7	49.0	336.8
1968	488.9	94.9	51.6	532.2
1969	666.6	95.8	60.4	702.0
1970	867.6	122.7	66.9	923.4
1971	750.5	113.6	80.1	783.2
1972	675.6	74.1	90.8	658.9
1973	1,117.0	78.3	129.3	1,066.0
1974	1,230.2	127.6	197.8	1,160.0
1975	774.9	72.7	207.6	640.0
1976	764.3	46.8	256.5	554.6
1977	1,165.1	58.5	430.1	793.5
1978	1,738.7	93.3	770.4	1,061.6
1979	2,208.9	119.6	942.8	1,385.7
1980	3,012.3	168.6	1,188.9	1,992.0
1981(r)	3,860.3	175.1	1,409.2	2,626.3
1982	3,141.5	175.0	994.1	2,322.4

r - Revised.

Exchange rate: 1963-1970 $1 = 360 Yen; 1971 $1 = 350 Yen; 1972 $1 = 302 Yen; 1973 $1 = 272.5 Yen; 1974 $1 = 291.51 Yen; 1975 $1 = 296.8 Yen; 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen.

Sources: Japan, Ministry of International Trade and Industry, and Ministry of Finance.

JAPANESE PRODUCTION, IMPORTS, AND EXPORTS OF METAL FORMING MACHINE TOOLS, 1964 to Date

(Values in Millions of U.S. Dollars)

	Production		Total Exports	Total Imports
Year	Units	Value	Value	
1964	18,339	$ 67.7	$ 5.9	$21.1
1965	15,910	72.8	6.6	12.3
1966	17,229	60.1	12.0	10.6
1967	17,571	106.2	9.1	15.4
1968	21,905	160.8	12.9	38.9
1969	23,033	195.8	18.3	39.4
1970	26,345	241.5	24.3	37.5
1971	16,466	202.0	34.3	40.6
1972	19,720	216.3	54.9	29.2
1973	27,168	360.1	86.4	31.6
1974	23,854	420.0	109.8	48.6
1975	12,447	284.8	105.6	51.3
1976	15,978	294.6	113.4	24.1
1977	16,326	438.0	186.0	27.5
1978	18,526	613.7	241.1	26.8
1979	23,995	687.1	286.6	45.0
1980	28,598	818.0	264.0	52.5
1981	27,961	936.8	276.3	40.4
1982	20,443	653.3	269.3	45.3

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

Number of Employees, 1965 to Date

Year	Employees	Year	Employees
1965	37,377	1974	45,295
1966	33,719	1975	40,925
1967	35,141	1976	34,509
1968	40,092	1977	32,168
1969	44,806	1978	28,154
1970	49,161	1979	31,113
1971	50,630	1980	33,737
1972	46,7[illegible]	1981	33,883
1973	45,242	1982	34,146

Source: Japan, Ministry of International Trade and Industry.

JAPANESE PRODUCTION, EXPORTS, AND IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1981 and 1982

(Values in Thousands of U.S, Dollars)

	1981			1982		
Type of Machine	Production	Exports	Imports	Production	Exports	Imports
Total						
Units	27,961	23,964	2,718	20,433	24,396	2,968
Value	$936,843	$276,293	$40,430	$653,258	$269,303	$45,260
Hydraulic Presses						
Units	6,909	2,067	155	5,634	1,945	83
Value	$164,721	$ 26,790	$ 1,758	$129,211	$ 34,969	$ 5,401
Mechanical Presses						
Units	13,352	2,060	256	8,425	2,020	553
Value	$576,089	$ 58,323	$ 4,154	$377,956	$ 79,799	$ 6,340
Forging Machines						
Units	466	304	24	350	293	148
Value	$ 31,080	$ 22,859	$10,992	$ 22,116	$ 13,455	$15,812
Shearing Machines						
Units	5,285	6,449	802	4,362	6,031	663
Value	$103,047	$ 76,089	$ 5,301	$ 60,618	$ 50,267	$ 2,654
Bending Machines						
Units	950	3,895	344	771	4,183	229
Value	$ 24,328	$ 34,095	$ 4,176	$ 29,697	$ 29,095	$ 3,044
Wire Forming Machines						
Units	999	166	9	891	259	3
Value	$ 37,578	$ 6,589	$ 385	$ 33,660	$ 9,472	$ 76
Other Metal Forming Machines						
Units	NA	9,023	1,128	—	9,665	1,289
Value	NA	$51,549	$13,663	—	$ 52,247	$11,155

NA - Not Available. Exchange rate: 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen.

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE PRODUCTION, EXPORTS AND IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, 1982

(Values in Thousands of U.S. Dollars)

	Production		Exports		Imports	
	Units	Value	Units	Value	Units	Value
TOTAL, (incl. NC)	146,546	$3,141,506	218,823	$994,082	12,972	$45,585
Horizontal Boring Machines	384	42,787	237	18,723	14	2,686
Jig Boring Machines	869	28,428	47	3,923	16	1,413
Boring Machines, NC	134	44,529	29	9,078	5	1,811
Boring Machines, N.E.C.	900	6,906	557	10,480	22	60
Radial Drilling Machines	1,322	16,394	399	5,272	—	—
Multi-Spindle Drilling Machines	543	12,447	128	22,006	—	—
Upright Drilling Machines	2,211	7,946	221	911	—	—
Drilling Machines, NC	201	7,380	64	5,437	3	1,486
Drilling Machines, N.E.C.	28,718	16,559	6,439	3,256	1,468	4,184
Gear Hobbing Machines	355	19,358	95	3,895	42	2,401
Gear Making Machines	508	29,018	71	3,835	153	32,082
External Grinding Machines	2,028	97,161	293	22,983	117	5,910
Internal Grinding Machines	760	49,468	115	5,449	81	6,111
Surface Grinding Machines	5,217	86,288	1,054	15,760	1,016	15,732
Grinding Machines, NC	296	24,036	58	8,267	107	11,335
Grinding Machines, N,E.C.	3,050	102,349	15,861	46,802	3,988	26,770
Center Lathes	4,888	72,307	752	20,140	1,594	10,709
Copying Lathes	21	1,048	44	1,538	2	124
Turret Lathes	92	1,779	80	2,104	—	—
Automatic Lathes	6,730	103,076	892	15,764	63	2,477
Vertical Lathes	114	13,977	58	6,477	7	269
Lathes, NC	10,298	560,823	4,382	313,050	17	5,513
Lathes, N.E.C.	2,588	15,378	456	7,244	781	6,103
Knee Type Machines	5,103	71,652	366	7,075	202	1,518
Milling Machines, NC	2,308	134,403	283	26,388	23	5,553
Milling Machines, N.E.C.	3,200	95,001	2,122	27,468	1,349	7,031
Planing Machines	72	10,556	27	1,466	1	257
Machining Centers	6,936	649,219	3,083	293,479	—	—
Other NC Machines	3,875	266,814	—	—	56	8,384
Broaching Machines	231	13,804	180,610	85,606	57	2,738
Special Machines	3,712	420,614			—	—
All Other Metal Cutting, N.E.C.	48,882	120,000			1,844	13,977

Exchange rate: $1 = 249.05 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine, For Selected Destinations, 1982
(Values in Thousands of U.S. Dollars)

	Destination									
Type of Machine	U.S.A.	Mexico	West Germany	United Kingdom	U.S.S.R	Australia	Taiwan	Singapore	Korea	Belgium
GRAND TOTAL										
UNITS	62,208	300	2,889	4,548	618	21,215	7,644	7,344	1,274	3,279
VALUE	$446,220	$48,332	$47,649	$43,907	$42,855	$37,723	$36,362	$26,898	$25,553	$24,862
Boring Machines										
Units	96	19	1	4	34	104	60	45	41	—
Value	$ 15,844	$ 1,931	$ 76	$ 68	$ 3,044	$ 5,890	$ 2,638	$ 116	$ 1,237	—
Drilling Machines										
Units	1,007	76	464	234	10	371	397	641	172	94
Value	$ 3,839	$17,964	$ 422	$ 137	$ 1,425	$ 1,622	$ 1,706	$ 598	$ 2,453	$ 28
Gear Cutting & Finishing										
Units	15	3	—	—	6	—	39	28	24	—
Value	$ 1,674	$ 422	—	—	$ 269	—	$ 1,458	$ 663	$ 1,277	—
Grinding Machines										
Units	3,213	65	70	946	235	1,255	522	832	342	499
Value	$ 25,220	$ 9,183	$ 759	$ 751	$14,387	$ 5,798	$ 8,312	$ 3,911	$ 6,633	$ 414
Lathes										
Units	2,799	29	291	433	46	239	315	266	150	225
Value	$196,149	$ 5,625	$15,900	$22,273	$ 9,918	$ 9,548	$ 5,609	$13,588	$ 4,148	$12,255
Milling Machines										
Units	1,877	21	56	71	11	155	150	67	88	—
Value	$ 16,398	$ 9,962	$ 1,245	$ 1,317	$ 1,205	$ 4,601	$ 5,782	$ 1,602	$ 3,819	—
Planing Machines										
Units	1	—	—	—	—	—	8	3	1	—
Value	$ 4	—	—	—	—	—	$ 1,048	$ 68	$ 24	—
Machining Centers										
Units	1,728	3	246	202	70	64	32	34	17	138
Value	$165,417	$ 377	$19,241	$17,342	$11,512	$ 6,075	$ 3,048	$ 2,602	$ 2,156	$11,853
Other Metal Cutting Machines										
Units	51,472	84	1,761	2,658	206	19,027	6,121	5,428	439	2,323
Value	$ 21,674	$ 2,867	$10,006	$ 2,020	$ 1,092	$ 4,188	$ 6,762	$ 3,750	$ 3,810	$ 313

Exchange Rate: $1 = 249.05 Yen.

Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE PRODUCTION OF NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1976 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1976	1977	1978	1979	1980	1981	1982
GRAND TOTAL							
UNITS	3,286	5,436	7,336	14,317	22,069	25,926	24,048
VALUE	$171,472	$299,980	$510,463	$937,423	$1,496,512	$1,967,642	$1,687,203
Boring Machines							
Units	26	37	49	52	103	135	134
Value	$ 4,677	$ 7,024	$ 18,772	$ 17,293	$ 35,652	$ 57,298	$ 44,529
Drilling Machines							
Units	108	264	230	143	249	301	201
Value	$ 5,011	$ 12,152	$ 10,952	$ 6,055	$ 8,710	$ 9,781	$ 7,380
Milling Machines							
Units	323	394	549	979	1,451	2,381	2,308
Value	$ 14,787	$ 20,591	$ 39,920	$ 61,026	$ 83,215	$ 138,430	$ 134,403
Grinding Machines							
Units	23	51	21	93	154	235	296
Value	$ 2,657	$ 3,169	$ 2,523	$ 7,401	$ 15,078	$ 19,653	$ 24,035
Lathes							
Units	2,073	3,677	4,986	8,203	12,036	12,134	10,298
Value	$ 88,872	$158,981	$274,918	$448,602	$ 672,891	$ 731,755	$ 560,823
Special Machines							
Units	22	50	33	62	101	103	137
Value	$ 4,910	$ 8,972	$ 8,567	$ 18,123	$ 28,370	$ 53,149	$ 39,795
Elec. Discharge Machines							
Units	NA	NA	NA	1,593	2,554	3,020	3,522
Value	NA	NA	NA	$ 80,298	$ 143,541	$ 180,846	$ 196,932
Machining Centers							
Units	526	926	1,371	2,927	5,231	7,393	6,936
Value	$ 44,701	$ 86,175	$149,323	$277,935	$ 491,383	$ 749,644	$ 649,219
Other NC Metal Cutting Machines							
Units	185	37	97	265	190	224	216
Value	$ 5,857	$ 2,916	$ 5,488	$ 20,692	$ 17,671	$ 27,085	$ 30,086

NA - Not Available.

Exchange rate: 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE TRADE WITH THE UNITED STATES NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1982

(Values in Thousands of U.S. Dollars)

	Exports to U.S.		Imports from U.S.	
Type of Machine	Units	Value	Units	Value
Boring Machines	13	$ 5,722	2	$ 903
Drilling Machines	11	410	2	1,421
Grinding Machines	31	4,332	20	4,983
Lathes	2,350	177,972	5	2,795
Milling	184	10,721	3	823
Machining Centers	1,728	165,417	—	—
Other	—	—	33	169

NA—Not Available. Exchange Rate: $1 = 249.05 Yen.

Source: Japan Tariff Association.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS

Selected Destinations, 1980 to Date

(Values in Thousands of U.S. Dollars)

Destination	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
TOTAL EXPORTS	198,926	$1,188,873	301,567	$1,409,164	218,823	$994,082
North & South America						
Brazil	614	$ 13,398	202	$ 6,312	251	$ 14,302
Canada	8,642	27,740	16,187	27,434	13,119	12,857
Mexico	658	14,060	384	14,492	300	48,332
U.S.A.	54,228	471,131	137,009	691,099	62,208	446,220
Western Europe						
Belgium	2,421	34,355	2,032	34,948	3,279	24,862
France	5,651	28,948	3,805	25,697	4,684	19,016
Netherlands	3,202	12,900	670	6,090	1,103	5,413
Norway	NA	6,240	634	5,210	457	3,228
Sweden	960	24,856	1,066	22,877	795	12,572
United Kingdom	5,574	64,366	4,387	50,864	4,548	43,907
West Germany	5,158	99,299	4,395	87,172	2,889	47,649
Eastern Europe						
Poland	30	3,246	110	10,452	—	—
Rumania	12	2,845	21	6,149	1	56
U.S.S.R.	519	53,429	486	49,581	618	42,851
Asia						
Burma	429	8,635	78	453	86	827
Korean Republic	3,885	55,118	1,267	30,821	1,274	25,553
People's Republic of China	274	8,234	278	15,095	368	5,967
Philippines	NA	3,114	2,009	3,496	2,028	4,975
Singapore	5,241	22,853	6,681	27,792	7,344	26,898
Taiwan	10,741	50,959	9,316	46,787	7,644	36,362
Thailand	NA	7,537	5,156	7,477	5,699	6,075
All Other Countries						
Australia	15,293	28,529	24,152	56,178	21,215	37,723
South Africa	5,385	39,480	4,305	48,488	2,936	12,495
All Other Countries	70,009(a)	107,601	76,937	134,199	75,977	115,942

Exchange rate: 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen.

(a) Includes the shipments to Norway, Thailand and the Philippines.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS TO THE U.S.

1977-1982

(Values in Thousands of U.S. Dollars, F.O.B. Japan)

	Total	Lathes	Drilling Machines	Boring Machines	Milling Machines	Grinding Machines	Other
1977							
Units	37,765	2,147	4,935	79	7,479	3,368	19,757
Value	$ 98,947	$ 57,915	$4,967	$ 4,952	$ 6,617	$ 3,251	$ 21,245
1978							
Units	58,742	2,891	2,281	161	7,661	1,275	44,473
Value	$193,006	$112.572	$5,440	$10,624	$ 9,640	$13,684	$ 41,046
1979							
Units	72,169	3,477	906	191	5,083	1,045	61,467
Value	$321,426	$181,813	$6,123	$17,726	$11,731	$16,905	$ 87,129
1980							
Units	54,228	4,109	1,053	210	3,426	1,843	43,587
Value	$471,131	$232,110	$8,983	$22,046	$26,430	$29,019	$152,543
1981							
Units	137,009	4,675	1,427	203	859	3,205	126,640
Value	$691,099	$337,151	$7,831	$20,528	$38,253	$27,865	$259,470
1982							
Units	62,208	2,799	1,007	96	1,877.	3,213	53,216
Value	$446,220	$196,149	$3,839	$15,844	$16,398	$25,220	$188,769

Exchange rate: 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS

From Selected Countries, 1980 to Date

(Values in Thousands of U.S. Dollars)

	1980		1981		1982	
Country of Origin	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	14,599	$168,561	17,244	$175,137	12,972	$175,005
United States	2,015	$ 42,423	1,790	$ 35,655	1,245	$ 44,513
Western Europe						
Austria	460	197	784	263	740	891
France	621	1,722	671	1,954	500	875
Italy	111	1,985	85	2,118	68	1,859
Sweden	104	866	141	2,467	106	1,602
Switzerland	970	36,468	847	41,155	615	35,993
United Kingdom	519	3,067	427	3,992	250	1,863
West Germany	763	48,650	1,225	53,535	1,200	47,589
Eastern Europe						
Czechoslovakia	90	2,010	73	11,687	11	887
East Germany	39	3,847	46	7,106	41	7,011
Poland	2	199	—	—	—	—
U.S.S.R.	261	4,786	183	2,435	277	3,806
Asia						
Singapore	512	5,085	737	7,214	694	6,661
Taiwan	6,784	4,613	8,879	6,294	5,914	6,107
Other Countries	1,368	12,663	1,356	9,332	1,311	15,348

Exchange rate: 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine and Selected Countries, 1982
(Values in Thousands of U.S. Dollars)

Type of Machine	West Germany	Switzerland	United States	Eastern Europe (a)	U.S.S.R.	France
	Country of Origin					
GRAND TOTAL						
Units	1,200	1,245	615	79	277	500
Value	$47,589	$44,513	$35,993	$8,287	$3,806	$875
Boring Machines						
Units	7	12	26	7	4	—
Value	$ 1,622	$ 1,550	$ 1,642	$ 815	$ 321	—
Drilling Machines						
Units	21	133	11	3	48	1
Value	$ 671	$ 3,172	$ 124	$ 68	$ 530	(b)
Gear Cutting and Finishing						
Units	33	76	50	13	6	—
Value	$ 6,705	$12,572	$ 9,600	$3,445	$ 305	—
Grinding Machines						
Units	466	553	191	20	30	35
Value	$19,827	$17,442	$ 9,769	$2,827	$ 578	$181
Lathes						
Units	51	28	90	8	10	—
Value	$ 1,847	$ 3,915	$ 5,565	$ 446	$ 458	—
Milling Machines						
Units	129	35	27	27	29	398
Value	$ 8,364	$ 883	$ 1,108	$ 434	$ 273	$546
Planing Machines						
Units	—	—	—	1	—	—
Value	—	—	—	$ 257	—	—
Other Metal Cutting Machines						
Units	493	408	220	—	150	66
Value	$ 8,552	$ 4,983	$ 8,187	—	$1,341	$145

(a) Czechoslovakia, East Germany, Bulgaria and Rumania.
(b) Less than $2,000.

Note: Individual items may not add to totals due to rounding.

Exchange rate: $1 = 249.05 Yen.

Source: Japan, Ministry of Finance.

UNITED KINGDOM NET NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS
1961 to Date
(Millions of Dollars)

Year	Net New Orders			Shipments			Unfilled Orders
	Total	Domestic	Foreign	Total	Domestic	Foreign	
1961	$ 356.3	$254.1	$102.2	$ 324.9	$244.5	$ 96.0	$328.2
1962	276.0	169.4	106.7	356.3	256.9	99.4	247.3
1963	265.4	171.3	94.1	319.2	209.7	109.6	193.0
1964	388.4	282.0	106.5	339.5	234.1	105.4	241.5
1965	442.0	322.0	120.0	395.9	272.9	123.0	292.0
1966	448.3	319.5	128.8	459.2	332.9	126.3	310.0
1967	446.6	276.7	169.9	473.7	342.8	130.9	279.2
1968	441.1	290.6	150.5	404.6	272.4	132.2	278.6
1969	569.3	361.7	207.6	453.8	285.8	168.0	394.1
1970	513.4	313.9	199.4	524.6	329.5	195.1	382.8
1971	380.9	199.8	181.1	513.1	300.6	212.4	261.8
1972	480.4	303.5	176.9	462.1	279.2	182.9	283.5
1973	701.2	429.1	272.1	487.2	286.8	200.4	473.0
1974	813.7	448.8	364.9	595.0	350.6	244.4	731.9
1975	548.4	321.5	226.9	723.0	414.2	308.8	510.6
1976	570.8	346.8	224.0	635.8	377.5	258.3	350.4
1977	839.8	553.5	286.3	707.1	443.5	263.6	471.4
1978	1,046.4	689.3	357.1	960.0	599.0	361.0	604.8
1979	1,260.3	771.6	488.7	1,205.9	793.6	412.3	742.7
1980(r)	1,038.8	562.3	476.5	1,370.6	813.9	556.7	418.7
1981	865.3	273.2	592.1	885.3	480.6	404.7	304.2
1982(p)	583.4	327.8	255.6	742.9	391.7	351.2	157.5

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
Number of Employees, 1967 to Date

Mid-Year	Employees	Mid-Year	Employees
1967	70,500	1977	50,600
1968	68,400	1978	52,000
1969	66,600	1979	51,800
1970	70,100	1980	50,900
1971	63,500	1981	43,400
1972	54,000	1982	39,500
1973	52,100		
1974	53,700		
1975	52,600		
1976	50,500		

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

Note: The U.K. Department of Trade and Industry has released a new series on employment in the machine tool industry for 1974 to date. Previous employment data, which included the welding equipment industry, have been adjusted by NMTBA to provide estimated employment in the machine tool industry for years prior to 1974.

UNITED KINGDOM SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, Units and Value, 1980 and 1981

(Values in Thousands of U.S. Dollars)

Type of Machine	1980		1981	
	Units	Value	Units	Value
TOTAL (excluding parts)	1,240	$198,985	NA	$165,037
Drilling Machines Boring Machines Milling Machines	56	23,051	39	17,259
Machining Centers (automatic tool change)	215	47,885	209	43,403
Machining Centers (manual tool change) and Indexing Turret	503	49,216	420	40,956
Lathes	406	72,743	NA	53,405
Other Numerically Controlled Machines	60	6,090	114	10,014

NA - Not Available.

Exchange Rate: 1980: 1 Pound = $2.3263; 1981: 1 Pound = $2.0279.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM ORDERS AND SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

1967 to Date

(Values in Thousands of Dollars)

Year	New Orders				Shipments			
	Total		Foreign		Total		Foreign	
	Units	Value	Units	Value	Units	Value	Units	Value
1967(a)	469	$ 18,059	101	$ 6,099	458	$ 25,102	NA	$ 8,877
1968(a)	505	34,157	130	10,904	558	28,500	109	6,113
1969(a)	693	42,245	248	16,596	543	35,105	189	14,738
1970(a)	725	52,561	350	26,978	600	37,773	241	15,848
1971	343	26,320	156	12,842	590	44,591	280	23,023
1972	548	42,199	189	14,551	381	27,173	150	12,735
1973	634	44,562	238	18,884	462	30,379	178	13,255
1974	739	65,520	353	32,362	709	37,452	246	15,171
1975	283	28,833	70	8,610	739	52,719	271	20,898
1976	535	57,429	157	17,820	612	48,635	192	17,598
1977	614	78,484	155	22,406	724	58,307	NA	17,347(b)
1978	681	105,986	209	26,135	969	102,376	245	29,086
1979	1,262	180,516	399	48,063	1,058	139,125	251	36,078
1980	978	160,736	397	60,193	1,240	198,985	421	54,712
1981	1,242	192,910	398	75,702	NA	165,037	399	56,167
1982(p)	NA	113,483	NA	29,314	NA	165,715	NA	71,301

NA - Not Available.

(a) Includes parts.
(b) Does not include figures for Drilling, Boring or Milling Machines.

Source: The Machine Tool Trades Association, and United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL CUTTING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1980 and 1981

(Values in Thousands of U.S. Dollars)

	1980		1981	
Type of Machine	Units	Value	Units	Value
TOTAL	37,313	$906,722	NA	$568,000
Boring Machines				
Fine	81	8,303	117	5,068
Horizontal	103	18,971	47	10,170
Jig, Vertical and Other	71	1,493	57	600
Drilling Machines				
Vertical	6,585	13,137	4,406	6,890
Radial	466	10,278	301	8,138
Other	64	4,946		
Gear Cutting and Finishing Machines	(b)	(b)	(b)	(b)
Grinding and Polishing Machines				
Cylindrical—External	937	73,772	NA	53,017
Cylindrical—Internal	54	5,576	34	3,157
Surface	1,424	27,890	615	12,636
Other Grinding	5,966	53,926	NA	33,303
Honing and Lapping				
Lathes				
Automatic (excl. plugboard)	630	65,876	331	36,511
Plugboard	859	28,016	401	11,204
Center Lathes	12,916	100,861	7,111	57,355
Other Lathes	668	46,175	203	17,823
Milling Machines				
Knee and Column	4,353	65,423	2,322	36,782
Bed Type	179	17,252	77	6,775
Other	NA	7,774	367	6,812
Other Metal Cutting				
Broaching Machines	71	16,303	36	12,084
Sawing and Cut-Off Machines	NA	12,664	NA	9,101
Screwing and Threading Machines	212	16,587	140	10,559
Transfer Machines	94	23,263	100	26,472
Machining Centers	938	82,607	662	56,329
Other Metal Cutting, N.E.C.	620	27,474	143	16,937
Parts for Metal Cutting Machine Tools	—	178,155(c)	—	130,280(c)

NA - Not Available.

(a) Excludes numerically controlled machines.
(b) Included in "Other Metal Cutting Machine Tools".
(c) Includes "Electrical Discharge Machines".

Exchange Rate: 1980: 1 Pound = $2.3263; 1981: 1 Pound = $2.0279.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)
By Type of Machine, Units and Value, 1980 and 1981
(Values in Thousands of U.S. Dollars)

Type of Machine	1980 Units	1980 Value	1981 Units	1981 Value
TOTAL	9,799	$264,865	7,243	$152,252
Presses				
Hydraulic-Open Front	438	8,107	253	7,148
Hydraulic Straight, Extrusion & Other	329	24,901	206	7,284
Mechanical Open Front	533	13,113	281	4,922
Mechanical—Straight Sided	268	27,764	46	4,942
Other Mechanical			112	10,742
Forging Machines	704	13,893	880	4,309
Shearing Machines	1,092	51,530	1,006	26,574
Plate & Sheet Bending & Forming	1,087	6,297	660	3,983
Bar, Tube & Section Drawing & Forming	2,682	13,532	2,267	9,414
Other Bending & Working	1,197	36,109	699	22,242
Riveting and Other Metal Forming	1,469	12,415	833	4,626
Parts for Metal Forming Machine Tools	—	57,204	—	46,066

Exchange Rate: 1980: 1 Pound = $2.3263; 1981: 1 Pound = $2.0279.

(a) Excludes numerically controlled machines.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM IMPORTS AND EXPORTS OF MACHINE TOOLS
New and Used, for Selected Countries, 1982
(Values in Thousands of U.S. Dollars)

Imports		Exports			
Origin	Value	Destination	Value	Destination	Value
West Germany	$120,955	U.S.A.	$119,823	Taiwan	$7,583
U.S.A.	91,256	South Africa	33,638	Belgium(a)	7,098
Japan	55,806	West Germany	25,618	Pakistan	6,981
Switzerland	28,727	Mexico	24,167	U.S.S.R.	6,901
Italy	27,978	France	23,789	Saudi Arabia	6,166
France	18,266	India	21,672	Singapore	6,033
United Kingdom	15,877	Ireland	16,907	Austria	5,228
Sweden	7,743	Canada	12,987	Netherlands	4,947
Netherlands	6,077	East Germany	12,857	Spain	4,276
Spain	6,021	Italy	11,448	Portugal	4,092
Belgium(a)	5,591	Sweden	9,585	Brazil	3,878
Austria	4,124	Switzerland	9,374	Denmark	3,241
Taiwan	3,676	Nigeria	8,936	New Zealand	2,878
Ireland	3,125	Australia	8,875	Japan	2,659
Denmark	2,699	Iraq	8,517	Egypt	2,569

(a) Includes data for Luxembourg.

Exchange Rate: 1 Pound = $1.7505.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1981

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	Rep. of So. Africa	France	Canada	Ireland	Italy
Grand Total (incl. N/C)								
Units	51,546	8,666	1,707	4,251	3,898	2,382	1,561	1,075
Value	$570,262	$153,050	$42,535	$50,267	$30,269	$27,032	$14,685	$14,194
Boring (incl. N/C)								
Units	319	86	28	21	3	7	4	41
Value	$ 41,160	$ 17,714	$ 6,132	$ 2,821	$ 537	$ 1,184	$ 94	$ 1,691
Boring, NC								
Units	72	25	10	1	2	3	—	8
Value	$ 20,891	$ 10,127	$ 3,304	$ 397	$ 456	$ 851	—	$ 796
Drilling (incl. N/C)								
Units	1,320	68	49	112	71	32	115	23
Value	$ 11,850	$ 769	$ 657	$ 1,827	$ 512	$ 187	$ 530	$ 188
Drilling, N/C								
Units	26	3	2	4	4	—	—	—
Value	$ 3,449	$ 282	$ 233	$ 882	$ 338	—	$ 1	—
Gear Cutting & Finishing (incl. N/C)								
Units	125	48	6	5	9	16	—	2
Value	$ 13,201	$ 5,825	$ 942	$ 594	$ 1,211	$ 795	—	$ 170
Gear Cutting, NC								
Units	2	1	1	—	—	—	—	—
Value	$ 619	$ 445	$ 173	—	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	20,637	1,029	351	587	3,049	140	120	118
Value	$ 90,285	$ 21,657	$ 8,247	$ 3,965	$ 3,072	$ 1,243	$ 1,867	$ 1,664
Grinding & Polishing, NC								
Units	112	—	3	—	101	—	—	—
Value	$ 3,029	—	$ 733	—	265	—	—	—
Lathes (incl. N/C)								
Units	4,692	1,240	462	363	231	162	151	190
Value	$120,709	$ 35,097	$ 9,360	$ 6,568	$ 7,061	$ 6,670	$ 3,335	$ 3,863
Lathes, N/C								
Units	193	58	27	6	16	15	8	2
Value	$ 28,822	$ 7,464	$ 4,718	$ 1,158	$ 2,913	$ 1,793	$ 939	$ 304
Milling (incl. N/C)								
Units	2,082	654	143	150	75	273	81	196
Value	$ 49,223	$ 18,245	$ 4,608	$ 3,135	$ 2,767	$ 1,940	$ 2,352	$ 2,130
Milling, N/C								
Units	73	17	17	3	12	—	4	1
Value	$ 9,465	$ 2,493	$ 1,579	$ 438	$ 1,017	—	$ 637	$ 95
Other Metal Cutting								
Units	2,449	298	64	151	64	13	232	59
Value	$ 61,103	$ 5,909	$ 3,990	$ 2,000	$ 9,135	$ 293	$ 1,480	$ 1,075
Total Metal Forming								
Units	7,950	880	445	810	259	338	597	96
Value	$107,860	$ 14,099	$ 7,102	$13,057	$ 4,942	$ 6,290	$ 4,052	$ 2,179

Exchange Rate: 1 Pound = $2.0279.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1982
By Type of Machine, Total and N/C; Total & Major Countries of Destination
(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	Rep. of So. Africa	West Germany	Mexico	France	India	Ireland
Grand Total (incl. N/C)								
Units	30,038	4,516	1,395	1,329	245	5,678	378	1,385
Value	$436,001	$102,867	$28,002	$24,599	$23,747	$22,997	$20,545	$15,860
Boring (incl. N/C)								
Units	651	154	18	38	6	28	10	11
Value	$ 30,435	$ 11,506	$ 471	$ 2,516	$ 467	$ 1,250	$ 2,157	$ 331
Boring, N/C								
Units	63	21	—	5	6	1	7	—
Value	$ 17,347	$ 7,781	—	$ 1,229	$ 467	$ 284	$ 1,938	—
Drilling (incl. N/C)								
Units	1,096	90	67	42	—	42	57	132
Value	$ 12,162	$ 3,034	$ 2,647	$ 531	—	$ 258	$ 341	$ 427
Drilling, N/C								
Units	25	10	2	1	—	1	—	—
Value	$ 4,151	$ 2,725	$ 195	$ 103	—	$ 68	—	—
Gear Cutting & Finishing (incl. N/C)								
Units	73	15	2	1	—	1	8	19
Value	$ 10,916	$ 1,461	$ 65	$ 123	—	$ 133	$ 890	$ 5,366
Gear Cutting & Finishing, NC								
Units	2	—	—	—	—	—	—	1
Value	$ 688	—	—	—	—	—	—	$ 430
Grinding & Polishing (incl. N/C)								
Units	73	15	2	1	—	1	8	19
Value	$ 10,916	$ 1,461	$ 65	$ 123	—	$ 133	$ 890	$ 5,366
Grinding & Polishing, N/C								
Units	37	6	—	3	15	1	1	—
Value	$ 16,628	$ 1,958	—	$ 1,089	$ 8,949	$ 102	$ 440	—
Lathes (incl. N/C)								
Units	4,267	1,143	183	331	37	253	19	147
Value	$ 91,981	$ 28,555	$ 3,079	$ 3,929	$ 2,702	$ 8,688	$ 1,318	$ 2,566
Lathes, N/C								
Units	229	78	9	12	5	26	2	5
Value	$ 32,332	$ 9,670	$ 1,269	$ 1,498	$ 859	$ 3,295	$ 432	$ 465
Milling (incl. N/C)								
Units	1,137	243	70	52	14	41	18	63
Value	$ 40,635	$ 12,024	$ 1,933	$ 2,367	$ 666	$ 1,359	$ 2,257	$ 823
Milling, N/C								
Units	76	18	1	7	1	6	3	1
Value	$ 11,255	$ 1,843	$ 282	$ 1,299	$ 188	$ 564	$ 1,516	$ 195
Other Metal Cutting								
Units	2,862	652	185	83	57	115	20	323
Value	$ 51,972	$ 16,274	$ 1,432	$ 3,778	$ 1,422	$ 4,179	$ 2,221	$ 1,904
Total Metal Forming								
Units	10,257	1,542	593	550	52	1,237	128	501
Value	$121,965	$ 14,590	$16,518	$ 5,818	$ 3,843	$ 5,011	$ 2,949	$ 2,693

Exchange Rate: 1 Pound = $1.7505.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1981

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	United States	Japan	Switzerland	Italy
Grand Total (incl. N/C)						
Units	58,912	7,821	3,169	1,820	831	6,096
Value	$425,701	$126,491	$80,221	$67,023	$34,645	$30,988
Boring (incl. N/C)						
Units	349	121	21	7	35	36
Value	$ 28,597	$ 13,811	$ 331	$ 254	$ 3,646	$ 3,984
Boring, N/C						
Units	69	34	3	4	7	4
Value	$ 15,607	$ 8,574	$ 73	$ 246	$ 1,942	$ 1,225
Drilling (incl, N/C)						
Units	8,437	402	366	156	62	82
Value	$ 11,704	$ 4,096	$ 1,712	$ 909	$ 1,400	$ 1,304
Drilling, N/C						
Units	36	12	11	11	—	—
Value	$ 3,513	$ 1,663	$ 905	$ 885	—	—
Gear Cutting & Finishing (incl. N/C)						
Units	60	19	9	—	3	9
Value	$ 7,307	$ 2,880	$ 1,015	—	$ 1,608	$ 792
Gear Cutting & Finishing, NC						
Units	3	—	3	—	—	—
Value	$ 805	—	$ 805	—	—	—
Grinding & Polishing (incl. N/C)						
Units	32,528	4,912	957	144	144	3,442
Value	$ 47,999	$ 15,837	$ 9,343	$ 983	$ 6,266	$ 2,918
Grinding & Polishing, N/C						
Units	48	6	22	1	11	2
Value	$ 8,438	$ 1,343	$ 3,051	$ 55	$ 2,118	$ 343
Lathes (incl. N/C)						
Units	2,134	249	221	401	98	162
Value	$ 92,480	$ 24,630	$11,911	$28,299	$ 5,608	$ 5,571
Lathes, N/C						
Units	615	93	88	352	11	12
Value	$ 69,106	$ 18,435	$11,018	$27,563	$ 2,198	$ 1,791
Milling (incl. N/C)						
Units	1,376	351	56	141	37	86
Value	$ 47,036	$ 10,890	$12,242	$ 3,484	$ 2,694	$ 4,454
Milling, N/C						
Unit	145	38	24	30	8	7
Value	$ 20,209	$ 7,520	$ 2,892	$ 1,316	$ 1,878	$ 1,422
Other Metal Cutting						
Units	6,159	621	487	395	100	766
Value	$ 84,647	$ 15,776	$21,425	$28,197	$ 5,786	$ 3,941
Total Metal Forming						
Units	7,869	1,146	1,052	576	352	1,513
Value	$105,933	$ 38,571	$22,242	$ 4,898	$ 7,636	$ 8,024

Exchange Rate: 1 Pound = $2.0279.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1982
By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	United States	Japan	Switzerland	Italy
Grand Total (incl. N/C)						
Units	41,231	9,613	3,208	1,714	781	3,774
Value	$404,446	$119,911	$90,794	$55,517	$28,718	$27,734
Boring (incl. N/C)						
Units	410	87	41	16	26	39
Value	$ 25,041	$ 10,750	$ 1,938	$ 1,548	$ 1,869	$ 1,310
Boring, N/C						
Units	72	31	6	13	5	2
Value	$ 17,153	$ 9,573	$ 635	$ 1,391	$ 1,080	$ 658
Drilling (incl, N/C)						
Units	6,000	301	278	77	41	62
Value	$ 10,811	$ 3,504	$ 2,806	$ 160	$ 148	$ 599
Drilling, N/C						
Units	50	11	29	4	—	1
Value	$ 4,408	$ 1,319	$ 2,414	$ 118	—	$ 168
Gear Cutting & Finishing (incl. N/C)						
Units	47	16	9	—	5	2
Value	$ 6,124	$ 1,639	$ 2,348	—	$ 620	$ 105
Gear Cutting & Finishing, NC						
Units	10	2	7	—	—	—
Value	$ 3,043	$ 345	$ 2,289	—	—	—
Grinding & Polishing (incl. N/C)						
Units	16,661	5,445	728	174	160	889
Value	$ 43,310	$ 11,841	$ 7,927	$ 939	$ 7,058	$ 2,335
Grinding & Polishing, NC						
Units	40	5	5	4	9	1
Value	$ 6,527	$ 589	$ 1,509	$ 328	$ 1,307	$ 154
Lathes (incl. N/C)						
Units	1,984	393	139	447	92	135
Value	$ 88,036	$ 21,823	$11,619	$26,000	$ 4,307	$ 5,868
Lathes, N/C						
Units	707	96	82	409	13	13
Value	$ 66,566	$ 15,515	$10,198	$25,071	$ 2,187	$ 2,451
Milling (incl. N/C)						
Units	1,151	299	53	60	39	114
Value	$ 38,253	$ 15,542	$ 1,723	$ 1,562	$ 4,000	$ 4,804
Milling, N/C						
Unit	131	59	13	25	8	13
Value	$ 19,514	$ 10,178	$ 1,310	$ 884	$ 3,178	$ 1,867
Other Metal Cutting						
Units	6,372	944	694	354	156	1,667
Value	$110,425	$ 24,047	$48,219	$20,685	$ 4,769	$ 4,653
Total Metal Forming						
Units	8,606	2,128	1,266	586	262	866
Value	$ 82,444	$ 30,565	$14,214	$ 4,622	$ 5,947	$ 8,060

Exchange Rate: 1 Pound = $1.7505.

Source: The Department of Trade and industry.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Type of Machine, Units and Value, 1980, 1981 and 1982
(Thousands of U.S. Dollars)

Type of Machine	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	16,051	$103,196	14,650	$141,863	12,735	$176.697
Metal Cutting Total	8,592	67,131	9,742	46,647	9,237	91,336
Lathes	709	19,932	501	15,962	353	25,995
Boring Machines	74	867	55	822	66	1,189
Milling Machines	936	3,727	705	1,527	475	3,127
Planing Machines	5	286	23	360	106	21
Broaching Machines	944	1,416	548	525	6	1,350
Drilling Machines	306	2,332	410	1,097	559	3,321
Grinding & Polishing Machines	4,446	15,477	598	6,010	6,039	19,316
Gear Cutting Machines	26	4,856	36	644	22	3,543
Other Metal Cutting	1,152	18,238	6,866	19,701	1,611	33,473
Metal Forming Total	7,459	36,065	4,908	95,216	3,498	85,361
Presses	901	15,723	418	79,003	894	52,054
Forging & Stamping Machines	13	153	43	979	25	6,214
Bending & Rolling Machines	462	4,158	2,319	7,565	360	7,288
Other Metal Forming	6,082	16,031	2,128	7,668	2,219	19,805
TOTAL EXPORTS	61,438	$228,268	70,895	$206,782	58,800	$175,525
Metal Cutting Total	21,485	174,922	23,236	155,313	15,325	124,654
Lathes	3,630	393,164	3,029	36,703	2,045	28,087
Boring Machines	319	11,289	181	12,878	142	11,006
Milling Machines	7,060	74,294	7,673	62,884	5,274	45,679
Planing Machines	9	109	41	1,021	25	679
Broaching Machines	916	2,783	581	2,502	104	130
Drilling Machines	2,280	11,917	1,744	11,097	2,174	9,038
Grinding & Polishing Machines	2,695	14,279	705	9,660	2,571	14,180
Gear Cutting Machines	16	192	20	290	22	541
Other Metal Cutting	4,560	20,743	9,262	18,276	2,968	15,314
Metal Forming Total	39,953	53,346	47,659	51,469	43,475	50,872
Presses	2,275	20,934	1,905	17,159	1,530	14,841
Forging & Stamping Machines	177	116	224	[illegible]313	92	2,694
Bending & Rolling Machines	35,149	17,842	43,748	1[illegible],262	1,828	6,726
Other Metal Forming	2,352	14,454	1,782	12,835	40,025	26,610

Exchange Rate: 1980 $1 = 71.702 Pesetas; 1981 $1 = 92.314 Pesetas; 1982 $1 = 109.52 Pesestas.

(a) Included with Planing Machines.

Source: Asociación Española de Fabricantes de Máquinas-Herramienta.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Origin and Destination, 1980 to date (a)

(Thousands of U.S. Dollars)

Country	Imports			Exports		
	1980	1981	1982	1980	1981	1982
GRAND TOTAL	$103,196	$141,863	$176,697	$228,268	$206,782	$175,525
Argentina	—	—	—	4,706	3,075	754
Australia	—	—	—	4,173	4,858	2,093
Austria	588	998	364	1,720	1,344	1,038
Belgium-Luxemburg	1,796	3,525	1,236	2,802	2,409	1,968
Canada	—	—	86	5,279	5,067	2,710
Chile	—	—	—	2,450	2,381	1,002
Cuba	—	—	—	1,483	3,462	8,811
East Germany	1,457	1,514	—	—	—	—
Ecuador	—	—	—	1,744	1,579	1,306
Finland	—	—	—	2,313	3,077	4,485
France	5,866	4,498	11,426	17,758	12,276	12,754
Italy	16,962	18,655	21,514	13,057	10,981	5,027
Japan	4,082	6,028	22,666	—	—	25
Mexico	—	—	231	25,097	38,342	32,907
Morocco	—	—	—	1,379	1,899	2,161
Netherlands	750	731	892	3,912	2,643	2,307
Portugal	—	—	—	6,620	8,517	5,624
South Africa	—	—	—	13,926	15,551	6,979
Sweden	—	763	1,288	1,554	1,966	2,105
Switzerland	6,121	5,295	5,739	4,309	2,711	1,469
United Kingdom	9,443	5,486	5,068	18,401	7,050	6,884
U.S.A.	9,919	9,535	19,176	26,721	21,501	21,910
Venezuela	—	—	—	7,194	4,885	7,328
West Germany	42,878	82,830	85,627	29,754	22,015	14,229
All Other	1,101	2,006	1,384	31,916	29,190	28,839

Exchange Rate: 1980 $1 = 71.702 Pesetas; 1981 $1 = 92.314 Pesetas; 1982 $1 = 109.52 Pesetas.

(a) Countries without data are included in "All Other."

Source: Asociación Española de Fabricantes de Máquinas Herramienta.

SPANISH MACHINE TOOL EMPLOYMENT AND CONSUMPTION

(Employment in thousands, Values in thousands of dollars)

Years	Shipments	Imports	Exports	Consumption	Employment
1972	$133,990	$ 73,194	$ 43,070	$164,024	12.1
1973	146,112	89,359	40,334	195,137	12.1
1974	206,873	135,009	69,789	272,093	12.2
1975	223,117	168,693	86,532	305,277	11.6
1976	183,600	132,679	90,811	225,468	11.0
1977	190,872	91,373	102,529	179,716	10.5
1978	232,185	90,072	147,579	176,823	10.3
1979	315,829	91,322	210,766	196,385	10.0
1980	352,849	103,196	228,268	227,777	9.5
1981	319,957	142,038	207,038	254,957	8.8
1982	260,226	176,697	175,525	261,398	8.5

Source: Asociacion Española de Fabricantes de Maquinas Herramienta.

FRENCH PRODUCTION OF METAL CUTTING MACHINE TOOLS
By Type of Machine, Units and Value, 1980, 1981 and 1982
(Values in Thousands of U.S. Dollars)

Type of Machine	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
Engine & Turret Lathes, NC	589	$51,454	539	$52,276	474	$48,862
Facing Lathes, NC	2	235	(c)	(c)	(c)	(c)
Vertical Boring & Turning Mills, NC	59	28,904	42	19,727	38	17,182
Turning Centers, NC	42	8,895	76	9,796	105	10,447
Engine Lathes, non-NC	2,406	87,076	(c)	(c)	1,407	25,539
Copying, Multi-tool, & Semi-automatic Turret Lathes, non-NC	319	34,195	163	21,395	101	9,170
Single-Spindle Automatic Lathes, non-NC	424	22,233	182	8,542	93	4,712
Other Lathes, non-NC	239	21,867	97	5,777	76	4,242
Comb. Boring & Milling Machines, NC	57	38,401	12	9,265	12	6,730
Comb. Boring & Milling Machines, non-NC	14	6,094	(c)	(c)	(c)	(c)
Boring Machines, NC	5	2,934	(c)	(c)	(c)	(c)
Boring Machines, non-NC	26	2,124	41	1,980	28	837
Milling Machines, NC	231	19,472	309	74,132	251	56,551
Knee-Type Milling Machines, non-NC	1,967	59,956	1,660	43,799	1,359	35,630
Bed-Type Milling Machines, non-NC	584	42,811	317	22,105	246	12,825
Other Milling Machines, non-NC	190	64,922	66	4,491	70	2,801
Drilling Machines, NC	6	471	(c)	(c)	(c)	(c)
Comb. Drilling & Boring Machines, NC	17	1,372	(c)	(c)	(c)	(c)
Radial Drilling Machines, non-NC	171	1,568	203	1,785	132	1,370
Bench Type Drilling Machines, non-NC	4,440	4,792	3,442	2,655	2,883	2,331
Pillar Type Drilling Machines, non-NC	2,710	5,067	2,269	3,868	1,702	3,148
Column Type Drilling Machines, non-NC	125	6,029	127	5,353	57	2,416
Grinding Machines, NC	42	7,959	14	1,333	(c)	(c)
Universal Tool & Cutter Grinding Machines, non-NC	234	3,295	58	435	(c)	(c)
Single Point Cutting Tool Sharpening Machines, non-NC	178	195	(c)	(c)	(c)	(c)
Cutter Sharpening Machines, non-NC	1,159	3,296	(c)	(c)	1,003	1,115
Other Tool & Cutter Grinding Machines, non-NC			243	4,119	285	4,063
Universal Cylindrical Grinding Machines, non-NC	49	2,314	37	1,583	45	2,062
Internal Cylindrical Grinding Machines, non-NC	125	11,642	38	1,028		
External Cylindrical Grinding Machines, non-NC			109	9,930	69	6,531
Surface Grinding Machines, non-NC	528	10,262	355	6,368	250	3,568
Other Grinding Machines, non-NC	185	30,736	179	22,877	80	5,714
Screw Cutting Machines, non-NC	103	5,103	74	3,069	(c)	(c)
Tapping Machines, non-NC	(a)	(a)	(c)	(c)	(c)	(c)
Planing Machines, non-NC	(a)	(a)	(c)	(c)	—	—
Slotting & Shaping Machines, non-NC	110	734	65	616	61	412
Surfacing Machines, non-NC	12,857	2,891	7,692	1,941	5,852	1,196
Polishing, Honing, & Lapping Machines, non-NC	1,387	3,016	1,030	1,675	895	4,085
Broaching Machines, non-NC	(a)	(a)	—	—	—	—
Gear Cutting Machines, non-NC	(a)	(a)	(c)	(c)	(c)	(c)
Sawing & Cut-Off Machines, non-NC	(b)	(b)	1,267	6,098	1,248	4,333
Band Sawing Machines, non-NC	430	4,216	330	2,878	322	2,849
Other Sawing or Cut-Off Machines, non-NC	3,490	10,081	1,939	4,356	1,960	4,048
Spark Erosion Machines, non-NC	(a)	(a)	—	—	(c)	(c)
Transfer Lines	(a)	(a)	219	99,135	201	71,223
Unit Heads	(a)	(a)	506	1,569	228	776
Machining Centers	61	19,367	119	27,605	123	28,503
Other Metal Cutting Machines, NC	6	2,830	14	3,759	45	18,761
Other Metal Cutting Machines, non-NC	1,525	162,467	11,976	68,247	11,096	54,064
Total Metal Cutting, NC	1,120	182,294	1,145	200,130	1,100	187,626
TOTAL METAL CUTTING	37,092	791,296	NA	NA	NA	NA

Exchange Rate: 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs.

(a) Included in "Other Metal Cutting Machines, non-NC."
(b) Included in "Other Sawing of Cut-Off Machines, non-NC."
(c) Data withheld.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION OF METAL FORMING MACHINE TOOLS
By Type of Machine, Units and Value, 1980, 1981 and 1982
(Values in Thousands of U.S. Dollars)

Type of Machine	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
Sheet Metal Bending Machines, non-NC	316	$ 3,497	264	$ 2,630	224	$ 2,003
Sheet Metal Folding Machines, non-NC	685	2,376	1,047	4,545	1,137	2,145
Sheet Metal Straightening Machines, non-NC	392	3,339	(c)	(c)	43	3,342
Bar & Tube Drawing Machines, non-NC	18	3,947	18	4,230	(c)	(c)
Straightening Machines, non-NC			2	316	(c)	(c)
Profiling, Flanging, & Molding Machines, non-NC	63	3,895	81	3,756	86	2,080
Other Bending Machines, non-NC	4,561	3,961	2,941	1,850	602	2,008
Punching, Shearing, & Comb. Punching & Shearing Machines, NC	11	2,366	(c)	(c)	(c)	(c)
Mechanical Shearing Machines, non-NC	199	2,554	466	2,156	249	1,180
Hydraulic Shearing Machines, non-NC	607	17,540	555	12,893	677	12,225
Other Shearing Machines, non-NC	2,034	2,136	1,989	1,507	1,754	2,796
Punching Machines, non-NC	123	2,282	342	1,289	262	807
Comb. Punching & Shearing Machines, non-NC	338	7,049	184	1,389	(c)	(c)
Wireworking Machines, non-NC	133	3,232	(c)	(c)	(c)	(c)
Presses, NC	99	4,305	(c)	(c)	(c)	(c)
Open Front Mechanical Presses, non-NC:						
Less than 10 tonnes	18	98	22	145	44	227
10-16 tonnes	77	906	55	389		
16-25 tonnes	56	1,658	35	512	30	246
25-40 tonnes	59	1,300	35	699	26	438
40-63 tonnes	15	633	11	282	11	236
63-80 tonnes	21	943	10	305	7	196
80-100 tonnes	19	945	12	428	5	155
100-125 tonnes	12	642	7	332	—	—
125+ tonnes	17	2,737	32	1,140	10	480
Single or Double Action, non-NC	40	9,796	42	9,197	(c)	(c)
Forging, Stamping, & Percussion Presses, non-NC	12	15,148	15	6,576	(c)	(c)
Presses w/ Automatic Feed, non-NC	75	10,167	(c)	(c)	(c)	(c)
Mechanical Press Brakes, non-NC	(a)	(a)	(c)	(c)	(c)	(c)
Hydraulic Press Brakes, non-NC	1,107	28,598	731	17,122	696	13,716
Drop & Air Hammers, non-NC	(a)	(a)	—	—	—	—
Open Front Hydraulic Presses, non-NC	342	5,984	233	4,060	80	1,493
Other Hydraulic Presses, non-NC	200	31,642	163	25,010	211	15,590
Other Metal Forming Machines, NC	8	284	17	1,267	31	833
Other Metal Forming Machines, non-NC	1,234	30,045	11,598	27,248	14,481	18,997
Total Metal Forming, NC	118	6,955	93	8,305	146	4,799
TOTAL METAL FORMING	12,891	204,005	NA	NA	NA	NA

Exchange Rate: 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs.

(a) Included in "Other Metal Cutting Machines, non-NC."
(b) Included in "Other Sawing of Cut-Off Machines, non-NC."
(c) Data withheld.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION AND EXPORTS OF N/C MACHINES (a)

Units and Value, 1968 to Date

(Values in Millions of U.S. Dollars)

Year	Production		Exports	
	Units	Value	Units	Value
1968	154	$ 12.2	46	NA
1969	154	12.7	64	NA
1970	147	11.0	46	$ 3.9
1971	247	25.0	83	10.5
1972	230	27.8	61	5.6
1973	389	42.7	141	12.6
1974	535	51.0	261	22.3
1975	612	75.5	217	23.7
1976	576	80.4	165	26.6
1977	579	97.6	223	52.7
1978	867	163.3	391	104.0
1979	1,068	196.1	417	94.5
1980	1,238	189.2	370	85.2
1981	1,238	208.4	NA	NA
1982	1,246	199.5	NA	NA

NA - Not Available.

(a) The survey covered metalworking and woodworking manufacturers.

Source: Syndicat des Constructeurs Français de Machines-Outils; Survey of 300 enterprises.

FRENCH MACHINE TOOL INDUSTRY

Selected Data, 1978 to Date

(Values in Millions of U.S. Dollars)

	1978	1979	1980	1981	1982
Employment	20,745	20,158	19,650	18,984	17,661
Production Workers	12,497	12,033	11,597	11,166(r)	10,265
Others	8,248	8,125	8,053	7,818	7,396
Average Weekly Hours	40.4	40.5	40.7	40.2	38.6
Compensation	$245.3	$282.1	$ 314.9	$271.3	$237.2
Wages	118.1	135.2	150.5	131.3	112.2
Salaries	127.2	146.9	164.4	140.0	125.0
Orders(a)	$783.3	$921.9	$1,015.4	$722.4	$ 587.7
Domestic	412.8	585.6	680.3	438.2	410.8
Foreign	370.4	336.3	335.1	284.2	176.9
Shipments(a)	$723.2	$877.1	$ 954.0	$809.5	$622.1

Exchange Rates: 1978 $1 = 4.513 Francs; 1979 $1 = 4.254 Francs; 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs.

(a) Excluding Tax.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH EXPORTS OF MACHINE TOOLS
By Destination, Units and Value, 1980 to Date
(Values in Thousands of U.S. Dollars)

	1980 (r)		1981 (r)		1982	
Destination	Units	Value	Units	Value	Units	Value
TOTAL	164,474	$515,859	NA	$390,482	NA	$295,038
WESTERN EUROPE						
Austria	22,632	3,022	10,078	2,195	570	2,572
Belgium-Luxembourg	28,656	15,747	3,851	12,628	4,521	11,826
Finland	1,130	1,572	756	2,098	373	2,772
Greece	3,191	4,006	NA	NA	283	5,495
Italy	31,176	26,400	9,148	16,939	3,533	12,937
Netherlands	6,689	5,956	1,529	3,542	1,399	3,295
Portugal	2,165	3,848	657	12,989	757	22,552
Spain	1,274	16,261	1,708	9,670	1,408	14,619
Sweden	3,479	5,097	1,116	5,697	972	2,421
Switzerland	8,013	16,696	3,450	16,867	3,984	12,468
Turkey	182	14,617	87	7,329	89	5,200
United Kingdom	4,213	22,183	8,592	19,803	3,840	16,363
West Germany	14,601	54,563	14.808	39,696	15,256	29,776
EASTERN EUROPE						
Czechoslovakia	122	4,368	11	992	23	2,460
East Germany	138	28,566	708	34,220	58	7,025
Rumania	245	34,485	62	2,715	NA	NA
U.S.S.R.	6,748	67,210	353	30,454	239	20,841
Yugoslavia	275	14,017	187	3,845	325	11,343
NORTH AND CENTRAL AMERICA						
Canada	498	4,254	874	7,424	492	1,345
Mexico	96	5,157	1,440	17,681	140	9,352
United States	4,871	30,574	4,707	31,104	3,593	11,024
SOUTH AMERICA						
Argentina	465	10,171	209	4,762	50	2,676
Venezuela	145	3,133	NA	NA	324	1,340
ASIA						
India	30	2,098	53	3,262	29	1,372
Iraq	253	3,357	972	4,156	672	6,994
Israel	125	1,521	220	2,734	296	1,569
Japan	1,570	2,569	710	1,316	510	915
People's Rep. of China	16	1,716	14	1,888	27	1,051
Saudi Arabia	1,370	3,227	698	7,196	1,099	3,241
Singapore	NA	NA	NA	NA	329	4,394
OCEANIA						
Australia	744	3,541	1,023	2,863	622	2,146
AFRICA						
Algeria	2,413	13,960	23,049	10,209	2,339	9,547
Egypt	518	4,664	145	9,844	222	4,514
Rep. of S. Africa	911	11,266	3,331	5,169	672	2,421
Tunisia	769	5,839	2,614	5,076	940	4,689
Franc Area (a)	3,600	10,439	3,162	8,050	2,717	7,124
OTHER	NA	59,759	NA	46,070	NA	35,359

NA - Not available; exports, if any, are included in "Other."   r - Revised.

Exchange Rate: 1980, $1 = 4.226 Francs; 1981, $1 = 5.4346; 1982 $1 = 6.5724 Francs.

(a) Franc Area — 1980: Cameroon, Ivory Coast, Madagascar, & Senegal; 1981: same as 1980 but including Congo; 1982: Cameroon, Congo, Gabon & Ivory Coast.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH IMPORTS OF MACHINE TOOLS
By Origin, Units and Value, 1960 to Date
(Values in Thousands of U.S. Dollars)

Destination	1980 Units	1980 Value	1981 Units	1981 Value	1982 Units	1982 Value
TOTAL	187,403	$554,058	271,801	$566,550	257,060	$479,278
WESTERN EUROPE						
Austria	1,353	5,232	1,598	4,427	1,911	5,145
Belgium-Luxembourg	2,043	11,457	1,047	13,670	655	12,244
Denmark	3,935	1,179	2,866	770	2,878	1,069
Finland	100	494	18	210	59	182
Italy	17,517	91,394	19,175	124,486	13,47[illegible]	98,904
Netherlands	10,719	11,292	17,009	4,853	14,332	4,782
Norway	12	64	24	338	13	419
Portugal	28	194	13	25	25	183
Spain	1,417	18,656	925	12,254	923	13,006
Sweden	1,011	8,878	655	8,851	1,357	4,552
Switzerland	2,948	65,120	4,430	57,486	2,168	50,721
United Kingdom	2,443	35,783	3,685	24,663	6,276	19,093
West Germany	37,871	190,255	36,970	194,311	29,114	156,968
EASTERN EUROPE						
Bulgaria	324	1,255	387	1,334	200	813
Czechoslovakia	121	3,888	147	2,663	123	3,011
East Germany	575	4,386	333	3,981	2,425	6,272
Hungary	20	715	17	551	23	1,638
Poland	6,038	3,110	1,208	1,639	2,687	972
Rumania	84	1,922	58	669	120	398
U.S.S.R.	2,461	4,100	774	1,758	289	1,921
Yugoclavia	62	521	22	149	54	279
NORTH AND CENTRAL AMERICA						
Canada	39	541	35	935	24	691
United States	3,533	39,909	1,822	41,579	4,261	35,971
ASIA						
India	32	425	7	151	20	302
Japan	4,010	40,596	4,734	48,179	2,813	45,728
Taiwan	87,766	6,726	172,095	9,680	169,421	6,818
OCEANIA						
Australia	2	9	NA	NA	1	96
OTHER	919	5,955	1,747	6,938	1,410	7,100

NA - Not available; imports, if any, are included in "Other."

Exchange Rate: 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH FOREIGN TRADE IN MACHINE TOOLS

By Type of Machine, Units and Value, 1980 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1980		1981		1982	
	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	187,220	$554,058	271,801	$566,550	257,060	$479,278
Metal Cutting Total (including N/C)	174,435	401,871	253,702	441,561	246,636	348,125
Boring Machines (including N/C)	493	24,349	1,168	38,307	280	25,786
Boring Machines, N/C	98	16,951	125	21,883	91	15,783
Drilling Machines (including N/C)	34,950	33,212	49,651	43,280	47,248	34,100
Drilling Machines, N/C	432	16,779	227	29,309	164	17,939
Gear Cutting	164	11,690	179	19,214	119	7,792
Grinding & Polishing	119,583	73,515	190,258	73,274	185,138	64,848
Lathes (including N/C)	6,093	126,336	4,269	102,872	3,908	82,848
Lathes, N/C	642	54,901	768	55,027	888	48,442
Milling Machines (including N/C)	1,944	61,991	1,829	62,865	1,581	48,482
Milling Machines, N/C	270	30,326	319	34,718	249	23,602
Other Metal Cutting	11,208	70,778	6,348	101,749	8,362	84,269
Metal Forming Total	12,785	152,187	18,099	124,989	10,424	131,153
Hydraulic Presses, non-NC	334	8,948	392	7,290	494	6,730
Mechanical Presses, non-NC	1,271	30,782	5,928	28,325	1,123	23,897
Presses, N/C	16	828	56	815	45	2,004
Forging Machines	118	12,344	101	5,922	96	7,643
Punching, Shearing, Bending and Forming Machines	6,505	56,743	5,974	43,922	5,307	49,907
Wire Drawing Machines	387	11,402	265	9,902	195	7,107
Other Metal Forming	1,154	31,140	5,383	28,814	3,164	33,867
TOTAL EXPORTS	164,474	$515,859	119,582	$390,482	66,189	$295,038
Metal Cutting Total (including N/C)	136,443	343,285	89,916	255,137	50,238	183,365
Boring Machines (including N/C)	19,433	21,045	19,348	13,461	242	9,365
Boring Machines, N/C	69	11,814	18,364	8,864	38	2,831
Drilling Machines (including N/C)	62,465	14,049	21,257	12,382	9,179	9,803
Drilling Machines, N/C	120	1,168	42	1,902	273	2,528
Gear Cutting	112	2,262	80	1,807	89	1,101
Grinding & Polishing	38,363	63,409	14,977	48,959	10,613	38,743
Lathes (including N/C)	3,337	106,985	2,377	68,108	2,018	47,319
Lathes, N/C	438	46,558	327	26,110	221	19,558
Milling Machines(including N/C)	3,618	84,361	2,532	65,691	2,421	41,416
Milling Machines, N/C	505	20,347	180	27,570	138	18,401
Other Metal Cutting	7,822	51,174	29,345	44,730	25,676	35,619
Metal Forming Total	28,031	172,574	29,666	135,345	15,951	111,673
Hydraulic Presses, non-NC	450	13,454	432	8,479	343	3,887
Mechanical Presses, non-NC	1,494	26,229	6,064	22,111	2,304	24,455
Presses, N/C	19	2,452	36	1,698	1	6
Forging Machines	309	1,815	406	972	358	3,671
Punching, Shearing, Bending and Forming Machines	11,214	59,160	9,468	41,891	6,234	36,429
Wire Drawing Machines	675	12,596	1,698	17,529	189	7,151
Other Metal Forming	14,161	56,868	11,562	42,665	6,522	36,074

Exchange Rate: 1980 $1 = 4.2260 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs.

Source: Syndicat des Constructeurs Français de Machine-Outils.

ITALIAN IMPORTS AND EXPORTS OF MACHINE TOOLS

By Origin and Destination 1980 to Date

(Thousands of U.S. Dollars)

	Imports			Exports		
	1980	1981	1982	1980	1981	1982
TOTAL	$356,366	$300,342	$208,595	$847,629	$795,222	$639,884
Austria	2,130	2,563	2,553	14,301	8,653	6,973
Belgium-Luxemborg	4,586	3,111	3,458	14,489	9,289	8,587
Brazil	(a)	(a)	(a)	15,808	12,810	7,406
Canada	(a)	(a)	2,021	13,520	16,784	9,280
Czechoslovakia	10,842	7,516	2,278	(a)	(a)	(a)
East Germany	13,998	12,615	7,198	(a)	15,204	(a)
France	24,811	16,674	12,294	94,877	116,632	89,453
Japan	6,098	11,807	5,687	(a)	(a)	4,745
Mexico	(a)	(a)	(a)	15,039	33,775	13,262
Netherlands	1,951	5,132	1,417	13,132	9,146	6,424
Poland	5,756	4,368	1,407	14,936	21,763	(a)
Rumania	1,294	2,784	(a)	36,482	12,776	(a)
Saudi Arabia	(a)	(a)	(a)	(a)	12,474	13,343
South Africa	(a)	(a)	(a)	24,389	39,074	19,281
Spain	10,842	11,760	6,115	16,984	19,861	19,672
Sweden	8,439	4,285	7,170	11,412	13,493	13,982
Switzerland	55,033	47,878	38,313	27,749	28,179	20.342
Turkey	(a)	(a)	(a)	(a)	17,383	10,529
United Kingdom	31,620	15,526	8,047	50,610	31,094	32,847
United States	16,863	19,190	20,030	58,005	46,205	42,572
U.S.S.R.	9,710	8,828	3,690	69,696	43,586	64,422
Venezuela	(a)	(a)	(a)	18,009	12,803	12,344
West Germany	135,787	112,866	79,934	102,619	96,445	60,725
Yugoslavia	1,775	2,205	782	31,123	13,777	11,761
All Other	16,606	11,234	6,201	212,986	164,017	171,934

(a) Imports and exports, if any, are included in "All Other."

Note: Individual items may not add to totals due to rounding.

Exchange Rate: 1980 $1 = 855.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire.

Source: Unione Construttori Italiana Macchine Utensili.

ITALIAN EXPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1979	1980	1981	1982
TOTAL	$689,039	$847,629	$795,222	$639,884
Lathes	90,843	129,851	102,730	78,740
Boring Machines	44,854	75,514	73,498	54,687
Milling Machines	64,533	83,238	78,543	57,389
Drilling Machines	46,808	56,613	52,852	38,447
Broaching Machines	3,677	6,366	6,725	3,431
Grinding Machines	63,752	77,236	67,698	45,450
Other Abrasive Machines	41,083	34,783	43,474	32,677
Gear Cutting Machines	1,774	3,290	2,790	3,026
Shaping-Sawing-Cutting off-Slotting Machines	27,677	32,283	33,762	23,878
Presses	68,901	66,168	67,108	47,326
Shears and Punching Machines	22,664	25,260	20,954	27,351
Bending Machines	41,248	45,027	36,731	34,367
Forging Machines	3,301	3,472	2,870	3,839
All Others	167,924	208,528	205,487	189,276

Exchange rates: 1979 $1 = 830.85 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Construttori Italiana Macchine Utensili.

ITALIAN IMPORTS OF MACHINE TOOLS
1979 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1979	1980	1981	1982
TOTAL	$255,919	$356,366	$300,342	$208,595
Lathes	40,895	80,891	61,736	34,265
Boring Machines	11,960	17,711	14,780	11,326
Milling Machines	30,919	40,820	36,650	22,828
Drilling Machines	8,152	11,146	12,738	7,016
Grinding Machines	26,315	31,793	26,538	23,757
Other Abrasive Machines	16,523	21,013	17,435	11,056
Gear Cutting Machines	7,395	9,476	9,222	5,602
Shaping-Sawing-Cutting off-Slotting Machines	8,513	12,395	11,161	7,903
Presses	25,458	32,044	23,638	18,902
Shears and Punching Machines	6,576	9,031	10,335	6,816
Bending Machines	8,900	10,579	11,696	7,531
Forging Machines	6,704	5,782	5,315	2,490
All Others	57,609	73,685	59,096	49,103

Exchange rates: 1979 $1 = 830.85 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Construttori Italiana Macchine Utensili.

ITALIAN PRODUCTION, IMPORTS AND EXPORTS OF MACHINE TOOLS

By Weight and Value, 1969 to Date

(Weights in Thousands of Metric Tonnes and Values in Millions of U.S. Dollars)

	Shipments		Imports		Exports	
Year	Weight	Value	Weight	Value	Weight	Value
1969	148.0	$ 332.8	42.2	$103.9	71.4	$171.7
1970	188.0	480.0	45.3	123.8	58.9	190.8
1971	186.0	516.2	45.9	159.9	61.8	186.0
1972	170.0	533.0	47.8	134.8	62.5	206.6
1973	162.0	620.9	55.6	187.0	57.2	236.4
1974	205.0	891.8	66.6	261.5	76.1	322.5
1975	160.0	842.5	45.0	212.9	75.7	432.1
1976	140.0	750.9	38.3	160.5	67.0	359.0
1977	146.5	878.3	39.6	192.9	76.5	442.4
1978	150.0	1,060.5	33.8	195.0	89.0	596.3
1979	160.0	1,354.0	36.7	255.9	91.4	689.0
1980	222.7	1,728.1	48.8	356.4	95.0	847.6
1981(r)	NA	1,539.4	44.0	300.3	86.3	795.2
1982	NA	1,138.6	25.6	208.6	70.9	639.9

NA - not available.

Exchange Rate: 1975 $1 = 552.85 Lire; 1976 $1 = 832.29 Lire; 1977 $1 = 882.39 Lire; 1978 $1 = 848.66 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire.

Source: Unione Construttori Italiani Macchine Utensili.

SWEDISH PRODUCTION, IMPORTS, AND EXPORTS OF MACHINE TOOLS

Cutting & Forming, By Type of Machine, 1981 and 1982

(Thousands of U.S. Dollars)

	Production		Imports		Exports	
Machine Classification	1981 (r)	1982 (E)	1981	1982	1981	1982
GRAND TOTAL	$280,685	$245,121	$234,417	$190,789	$215,340	$176,844
Total Metal Cutting	138,301	108,235	134,846	114,989	100,915	71,587
Drilling Machines	11,549	7,958	6,721	5,249	11,212	7,521
Gear Cutting Machines	—	—	2,959	1,151	274	258
Grinding and Polishing	51,079	43,772	22,730	18,334	42,728	29,604
Lathes	47,162	37,405	35,821	30,304	28,668	20,499
Milling Machines	24,449	16,076	25,557	26,087	12,819	10,364
Broaching Machines	—	—	1,236	4,381	351	39
Planers and Shapers	19	159	128	26	184	245
Other Metal Cutting Machines	4,041	2,865	39,694	29,456	4,678	3,057
Total Metal Forming	72,582	71,626	56,708	36,239	63,406	66,879
Hammers	1,308	1,114	1,129	296	1,238	1,424
Presses incl. Forging Presses	15,831	14,325	22,816	8,421	19,401	31,110
Punching and Shearing Machines	13,938	11,938	13,450	12,090	11,049	7,917
Other Metal Forming Machines	41,505	44,249	19,312	15,432	31,718	26,427
Parts and Accessories	69,803	65,260	42,863	39,561	51,019	38,378

E - Estimate. r - Revised.

Exchange Rate: 1981 $1 = 5.0634 Kronor; 1982 $1 = 6.2826 Kronor.

Source: The Swedish Machine Tool Manufacturers' Association.

SWEDISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Country, 1980 to Date

(Thousands of U.S. Dollars)

Country	Imports 1980	Imports 1981	Imports 1982	Exports 1980	Exports 1981	Exports 1982
TOTAL	$184,988	$191,554	$151,228	$180,880	$164,321	$138,465
Europe	140,965	144,961	122,126	121,405	91,535	83,522
Austria	1,359	1,249	(a)	1,782	2,082	(a)
Belgium	4,718	2,239	(a)	3,898	1,448	(a)
Denmark	6,764	5,101	4,572	8,633	7,854	7,831
Finland	1,950	2,845	2,356	13,207	11,721	10,153
France	5,615	6,032	2,240	7,460	9,101	4,896
Italy	16,206	13,981	19,305	10,259	5,046	7,060
Netherlands	2,660	2,165	(a)	2,715	2,163	(a)
Norway	896	427	(a)	9,635	9,486	7,797
Portugal	9	35	(a)	255	655	(a)
Spain	1,972	2,251	2,604	1,196	869	833
Switzerland	13,763	14,921	10,898	3,300	1,936	2,157
United Kingdom	14,270	10,615	8,501	19,255	10,248	9,436
West Germany	59,560	74,659	57,897	25,345	16,743	12,421
East European Bloc	10,554	8,271	NA	13,320	10,359	NA
Czechoslovakia	3,351	3,803	2,674	131	398	(a)
U.S.S.R	2,040	1,097	3,064	7,476	4,598	9,432
Other East Bloc(b)	5,163	3,371	(a)	5,713	5,363	(a)
All Other Europe	668	171	8,014	1,145	1,824	11,507
United States	13,748	13,920	9,466	30,704	29,400	27,385
Canada	76	95	414	4,055	4,287	2,915
South & Central America	—	31	1	8,564	14,887	2,758
Japan	27,321	29,746	17,277	2,141	3,804	5,782
All Other Asia	2,878	2,800	1,920	8,087	12,452	11,715
Africa	—	—	21	4,389	6,838	3,087
Australia, New Zealand, West Samoa	—	—	4	1,535	1,118	1,299

Exchange Rate: 1980 $1 = 4.2296 Kronor; 1981 $1 = 5.0634 Kronor; 1982 $1 = 6.2826 Kronor.

(a) Included in "All Other Europe."
(b) Includes Bulgaria, GDR, Hungary, Poland and Romania.

Note: Individual items may not add to totals due to rounding.

Source: The Swedish Machine Tool Manufacturers' Association.

NUMBER OF COMPANIES AND EMPLOYEES IN THE SWEDISH MACHINE TOOL INDUSTRY

	1978	1979	1980	1981	1982	Forecast 1983
Number of Companies	40	40	40	38	36	35
Number of Employees	4,100	4,100	4,000	3,700	3,100	2,900

Source: The Swedish Machine Tool Manufacturers' Association.

SWISS EXPORTS AND IMPORTS OF MACHINE TOOLS

1980 to Date

(Thousands of U.S. Dollars)

	Exports			Imports		
	1980	1981	1982	1980	1981	1982
GRAND TOTAL	$870,205	$740,324	$713,962	$225,160	$188,809	$157,674
Argentina	6,774	4,264	3,597	—	—	—
Australia	3,598	3,110	3,866	6	—	15
Austria	19,475	17,466	13,677	2,816	3,037	2,199
Belgium-Luxembourg	10,567	7,294	6,425	955	481	762
Brazil	9,448	7,578	6,388	5	—	216
Bulgaria	7,562	10,189	10,859	437	271	35
Canada	4,437	5,456	7,495	85	11	12
People's Rep. of China	14,074	19,658	30,584	—	—	18
Czechoslovakia	10,677	6,113	10,412	2,727	1,428	1,264
Denmark	7,057	3,504	3,358	1,643	1,870	1,305
East Germany	13,013	9,460	9,114	1,672	705	522
Finland	3,278	5,035	5,912	373	244	184
France	83,302	54,708	49,468	14,702	15,002	11,254
Hungary	6,577	6,836	3,340	411	157	472
India	13,988	20,471	14,323	340	87	119
Indonesia	340	1,073	4,811	—	—	—
Iraq	2,237	2,445	22,315	—	—	—
Israel	4,152	3,147	3,371	51	—	9
Italy	56,548	48,750	37,833	26,324	24,653	20,969
Japan	35,673	43,965	33,290	14,972	19,984	13,795
Mexico	8,707	8,506	5,378	—	—	—
Netherlands	12,833	10,600	8,585	2,401	2,802	2,370
Pakistan	1,127	723	916	—	—	
Poland	17,345	14,769	6,016	2,479	995	207
South Africa	12,852	13,934	15,345	—	—	—
Spain	5,860	6,037	4,930	4,771	3,082	1,670
Sweden	13,265	14,234	10,696	3,294	2,094	2,074
Taiwan	8,035	4,496	5,187	715	774	344
United Kingdom	47,280	39,292	28,634	15,241	10,746	7,430
United States	94,586	79,666	73,039	10,413	7,931	8,816
U.S.S.R	81,580	50,855	80,190	1,062	462	572
West Germany	205,725	155,513	146,286	116,322	90,817	79,849
Yugoslavia	16,750	13,844	14,512	122	103	237
All Other	52,603	48,056	34,726	811	1,073	955

Exchange Rate: 1980 $1 = 1.6749 Swiss Francs; 1981 $1 = 1.9642 Swiss Francs; 1982 $1 = 2.0303 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: Verein Schweizerischer Maschinen-Industrieller.

NETHERLANDS SALES OF MACHINE TOOLS AND PARTS

By Machine Types, 1977 to Date

(Thousands of U.S. Dollars)

Country	1977	1978	1979	1980	1981	1982
GRAND TOTAL	$53,620	$54,631	$58,425	$67,854	$63,722	$47,674
Metal Cutting Machine Tools	26,729	25,374	25,224	29,123	28,334	25,841
Metal Forming MachineTools	19,435	23,202	26,820	32,594	27,172	17,040
Hydraulic Presses	3,749	4,345	4,038	6,438	11,743	4,045
Mechanical Presses	2,893	3,235	4,287	6,388		
Bending, Forming, Straightening, Cutting & Edging	2,608	2,773	2,941	2,364	1,844	4,831
Other Metal Forming	10,186	12,849	15,553	17,404	13,586	8,164
Metal Cutting Parts & Accessories	4,441	1,941	2,692	3,370	8,216	4,794
Metal Forming Parts & Accessories	3,015	4,114	3,689	2,766		

Exchange Rate: 1977 $1 = 2.4543 Guilders; 1978 $1 = 2,1636 Guilders; 1979 $1 = 2.006 Guilders; 1980 $1 = 1.9881 Guilders; 1981 $1 = 2.4952 Guilders; 1982 $1 = 2.6702 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Type of Machine, 1980 to Date

(Values in Thousands of U.S. Dollars)

	Imports			Exports		
Type of Machine	1980	1981	1982	1980	1981	1982
TOTAL	$213,520	$168,443	$160,250	$126,955	$107,647	$101,303
Lathes	32,745	25,008	17,152	8,651	5,130	4,232
Milling Machines	27,715	23,325	28,650	13,279	15,109	14,381
Grinding, Honing and Polishing Machines	18,007	16,351	14,868	14,587	15,069	15,130
Hydraulic Presses	5,784	3,887	4,232	3,622	3,847	3,258
Other Presses	6,539	3,286	3,033	2,766	761	899
Bending, Forming, Straightening, Cutting and Edging Machines	27,061	12,424	11,535	35,411	20,920	20,373
Other Metalworking Machine Tools	39,435	29,256	28,013	10,965	13,987	11,422
Parts and Accessories	56,235	54,905	52,768	37,674	32,823	31,608

Exchange Rates: 1980 $1 = 1.9881 Guilders; 1981 $1 = 2.4952 Guilders; 1982 $1 = 2.6702 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

CANADIAN IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Types of Machine, 1980 to Date

(Values in Thousands of U.S. Dollars)

	1980		1981		1982	
Machine Classifications	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	NA	$528,881	NA	$674,543	NA	$328,685
Boring Machinery & Parts	347	34,881	346	54,131	272	25,671
Drilling Machinery & Parts	12,262	14,875	27,529	14,900	12,263	10,784
Grinding Machinery & Parts	59,529	52,324	125	14,591	53,463	26,546
Automatic Lathes	668	47,247	67,612	64,446	410	27,096
Turret Lathes, N.E.C.	629	5,638	866	51,425	2,404	2,041
Lathes & Parts, N.E.C.	2,235	33,182	859	5,686	861	15,095
Milling Machines & Parts	2,686	36,079	2,058	28,538	1,039	20,825
Shapers, Gear Makers & Parts	643	27,653	3,932	35,836	703	19,074
Transfer Machines & Parts	72	73,774	1,230	50,423	43	26,451
Sawing Machines & Parts	NA	13,285	NA	20,455	NA	11,167
Metalworking Presses & Parts	1,050	39,723	NA	16,439	915	25,024
Rolls, Bending Machines & Parts	NA	17,010	NA	15,662	NA	12,882
Shearing Machines & Parts	500	11,334	1,866	63,396	234	6,180
Metal Forging Stamping Machines & Parts	114	9,398	475	7,455	86	12,279
Can Making Machinery & Parts	NA	16,522	702	107,214	NA	23,789
Machine Tools & Parts, N.E.C.	NA	95,925	NA	123,946	NA	63,782
TOTAL EXPORTS(a)	NA	$ 85,161	NA	$ 99,772	NA	$154,458
Boring, Drilling Machinery & Parts	163	4,835	156	3,740	430	7,653
Grinding Machinery & Parts	127	6,496	128	5,773	91	2,840
Lathes & Parts	294	6,958	268	6,930	157	6,025
Metalworking Presses & Parts	298	10,455	329	10,018	157	5,040
Machine Tools & Parts, N.E.C.	NA	56,417	NA	73,311	NA	132,900

NA - Not Available.   N.E.C. - Not Elsewhere Classfied.

(a) Domestic exports; does not include re-exports by Canada.

Exchange rate: 1980 $1 = 1.1693 Canadian dollars; 1981 $ 1 = 1.1989 Canadian dollars; 1982 $1 = 1.2337 Canadian dollars.

Source: Statistics Canada.

ARGENTINE INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1978 and 1979

Selected Product or Industry	Units of Measure	1978	1979
Machine Tools	Mill. U.S. $	60.0	62.0
Metal Cutting Tools	Mill. U.S. $	24.0	24.5
Metal Forming Tools	Mill. U.S. $	36.0	37.5
Petroleum	Thou. cu. Meters	26,251.0	27,435.0
Refrigerators	Thou. Units	128.0	209.0
Automobiles	Units	179,160	252,882
Tractors	Units	5,939	10,610
Televisions	Thou. Units	350.0	390.0
Electric Power	Kw. hrs.	435.8	718.2
Cement	Thou. tons	6,123.2	6,998.4
Pig Iron	Thou. tons	1,819.2	1,942.2
Raw Steel	Thou. tons	2,787.7	3,192.9
Rolled Steel	Thou. tons	2,552.5	2,955.6

Source: La Camara Argentina De La Máquina Herramienta and "American Machinist".

CZECHOSLOVAK PRODUCTION OF MACHINE TOOLS
By Type of Machine, In Units, 1970 to 1975

Type of Machine	1970	1971	1972	1973	1974	1975
GRAND TOTAL	44,342	47,230	44,454	38,852	38,788	38,572
Metal Cutting Total	35,186	39,568	36,910	31,653	30,188	29,660
Boring Machines	582	580	594	572	558	558
Drilling Machines	6,167	5,853	5,024	NA	NA	NA
Grinding Machines	13,581	17,450	15,685	12,333	11,923	11,917
Lathes						
Center Type	5,833	6,141	6,372	6,327	5,941	5,808
Automatic & Semi-Automatic	1,431	1,447	1,530	1,290	1,254	1,226
Milling Machines	2,894	3,149	3,185	2,847	2,627	2,440
Other Metal Cutting	4,698	4,938	4,520	NA	NA	NA
Metal Forming Total	9,156	7,662	7,544	7,199	8,600	8,912
Power Presses	1,356	1,253	1,532	1,763	1,692	1,919
Other Metal Forming	7,800	6,409	6,012	5,436	6,908	6,993

NA - Not Available.

Sources: Czechoslovakia Statistical Abstract - 1971 and Statistical Survey of Czechoslovakia 1977.

CZECHOSLOVAK IMPORTS AND EXPORTS OF MACHINE TOOLS
In Units, for Selected Years, 1965 to Date

	Imports			Exports
Year	Total	Metal Cutting	Metal Forming	Total Machine Tools
1965	4,603	3,915	688	13,572
1967	4,184	3,582	602	15,114
1968	5,770	4,972	798	12,749
1969	6,310	5,607	703	17,411
1970	8,020	6,670	1,350	10,953(a)
1971	9,426	8,350	1,076	13,191
1972	9,589	8,422	1,167	12,108
1973	6,969	6,017	952	10,139(a)
1974	10,624	7,806	2,818	9,689(a)
1975	9,753	7,850	1,903	11,320(a)
1976	8,229	6,789	1,440	11,640(a)
1977	13,445	12,235	1,209	9,535(a)
1978	NA	NA	NA	NA
1979	NA	NA	NA	NA
1980	12,763	11,002	1,761	10,104(a)
1981	7,452	6,534	918	11,260(a)

NA - Not Available.

(a) Metal Cutting Machines only.

Sources: Facts On Czechoslovak Foreign Trade - 1978 and Czechoslovakia Statistical Abstract - 1971.

CZECHOSLOVAK IMPORTS AND EXPORTS OF METALWORKING MACHINERY

By Selected Origin and Destination, 1980 and 1981

(Thousands of U.S. Dollars)

	Imports		Exports	
	1980	1981	1980	1981
TOTAL	$296,855	$332,634	$521,866	$762,612
WESTERN EUROPE				
Austria	11,961	4,588	4,886	2,972
Belgium	986	1,257	3,040	2,463
Denmark	755	203	1,817	1,572
France	3,185	1,758	3,762	3,712
Italy	5,143	5,010	13,830	11,138
Netherlands	1,231	713	2,305	2,449
Norway	—	—	1,939	1,639
Spain	—	—	1,355	3,099
Sweden	1,735	650	3,915	4,014
Switzerland	13,456	12,562	10,356	6,655
United Kingdom	3,804	1,926	6,043	3,607
West Germany	46,273	43,707	17,377	14,808
EASTERN EUROPE				
Bulgaria	11,841	9,394	23,521	41,287
East Germany	68,433	75,775	59,940	67,528
Hungary	16,119	17,702	28,598	27,203
Poland	19,240	27,778	32,945	41,774
Rumania	10,898	47,014	43,786	71,401
U.S.S.R.	62,763	64,349	174,958	356,487
Yugoslavia	13,071	12,290	23,098	21,579
NORTH AND CENTRAL AMERICA				
Canada	—	—	8,208	9,484
Cuba	—	—	1,678	815
Mexico	—	—	7,328	8,980
USA	421	436	8,318	6,431
SOUTH AMERICA				
Argentina	—	—	3,560	2,968
Brazil	—	—	1,879	1,129
Peru	—	—	1,438	2,661
Venezuela	—	—	—	3,129
ASIA				
Algeria	—	—	460	1,926
Egypt	—	—	2,158	1,342
India	—	—	4,019	6,177
Iran	—	—	1,272	3,738
Japan	370	214	2,477	4,778
So. Korea	3,845	3,041	379	772
Syria	—	—	3,429	1,986
Turkey	—	—	923	787
PACIFIC				
Australia	—	—	1,143	3,704
New Zealand	—	—	1,009	1,501
ALL OTHER COUNTRIES	1,325	2,265	14,719	14,913

Exchange Rate: 1980 $1 = 5.25 Czechoslovak Crowns; 1981 $1 = 5.8 Czechoslovak Crowns.

Source: Facts on Czechoslovak Foreign Trade - 1982.

U.S.S.R. INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1978 to 1980

	Unit of Measure	1978	1979	1980
MACHINE TOOL INDUSTRY				
Metal Cutting Machines	Thousands	236	231	216
Metal Cutting Machines	Mill. Rubles	1,748	1,844	1,940
Metal Cutting Machines, NC	Units	7,300	7,937	8,848
Presses—Forging Machines	Thousands	55	55	57
Presses—Forging Machines	Mill. Rubles	507	541	565
OTHER SELECTED PRODUCTS ANO INDUSTRIES				
Electric Power	Bill. Kwh	1,202	1,239	1,295
Petroleum	Mill. Tons	572	586	603
Gas	Bill. Cu. Meters	372	407	435
Coal Incl. Coking Coal	Mill. Tons	724	719	716
Cast Iron	Mill. Tons	111	109	107
Steel	Mill. Tons	151	149	148
Rolled Ferrous Metal	Mill. Tons	122	119	118
Steel Pipe	Mill. Meters	NA	2,616	2,609
Steel Pipe	Mill. Tons	18	18	18
Iron Ore	Mill. Tons	244	242	245
Instruments & Automation Equip. with Spare Parts	Mill. Rubles	4,400	4,900	5,400
Computing Equip. with Spare Parts	Mill. Rubles	3,300	3,900	4,500
Automotive Vehicles	Thousands	2,088	2,173	2,199

Source: U.S.S.R. Central Statistical Administration.

As the exchange rate of the ruble is controlled, value figures are given in rubles.

The official exchange rate: 1978 $1 = .680 rubles; 1979 $1 = .654 rubles; 1980 $1 = .649 rubles.

U.S.S.R. PRODUCTION OF MACHINE TOOLS
Units For Selected Years, 1937 to 1980

Year	Metal Cutting Machine Tools	Forging Machines & Presses	Year	Metal Cutting Machine Tools	Forging Machines & Presses
1937	48,500	3,125	1970	202,300	41,268
1940	58,400	4,668	1971	207,000	42,300
1945	38,400	2,871	1972	211,000	44,000
1950	70,600	7,684	1973	214,000	46,500
1955	117,100	17,117	1974	224,000	48,900
1960	155,900	29,933	1975	231,000	50,500
1961	165,000	30,520	1976	232,000	51,900
1962	176,800	33,434	1977	236,000	54,300
1963	182,700	34,221	1978	236,000	55,400
1964	184,400	34,497	1979	231,000	55,200
1965	186,100	34,637	1980	216,000	57,100
1966	192,200	38,412			
1967	197,000	41,126			
1968	200,600	42,128			
1969	205,300	42,658			

Source: The U.S.S.R. in Figures for 1980--U.S.S.R. Central Statistical Administration.

METAL CUTTING (a) MACHINE TOOL PRODUCTION (c)
U.S. and Selected Communist Countries
For selected years, 1970—1981

	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981
United States (b)										
Million US $	$1,097.70	$1,224.70	$1,525.60	$1,790.40	$1,592.20	$1,789.40	$2,139.00	$2,900.00	NA	NA
Thousand units	49.31	57.88	69.00	64.32	54.10	59.40	58.12	76.07	61.37	72.01
Communist Countries										
USSR and Eastern Europe										
USSR										
Million US $	$1,427.88	$1,843.98	$2,025.02	$2,179.78	$2,340.38	$2,556.49	$2,805.78	$2,959.87	NA	NA
Thousand units	202.16	213.79	225.59	231.35	232.79	237.56	237.88	230.00	216.0	205.0
Bulgaria (thousand units)	13.94	15.66	15.47	16.28	14.44	13.74	15.32	16.47	18.90	19.60
Czechoslovakia(thousand units)	35.19	31.65	30.19	29.66	31.73	37.61	34.25	35.66	36.80	38.28
East Germany (thousand units)	22.22	19.16	19.11	19.72	19.42	18.76	19.33	18.42	17.50	16.80
Hungary (thousand units)	14.48	9.20	12.67	12.83	14.01	15.27	12.69	12.06	9.80	8.73
Poland (thousand units)	29.73	34.70	33.81	33.19	24.23	23.18	30.00	30.86	26.20	22.27
Romania (thousand units)	14.14	20.55	24.83	28.27	29.95	30.07	27.55	27.19	29.40	32.05
China (thousand units)	140.00	NA	NA	175.00	NA	200.0	180.00	140.00	134.00	103.00

NA - Not Available.

(a) Power-driven metal cutting machines that are not portable by hand and are used to remove metal in the form of chips; these machines include planers and milling, honing, lapping, grinding, electro-erosion, and ultrasonic cutting machines.

(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1982."

METAL FORMING MACHINE TOOL (a) PRODUCTION (c)
U.S. and U.S.S.R.
For selected years, 1970—1981

	1970	1973	1974	1975	1976	1977	1978	1979	1980	1981
United States										
Million US$	$454.1	$563.1	$640.4	$615.7	$586.0	$651.3	$784.7	$990.3	NA	NA
Thousand units(b)	24.2	30.7	37,0	26.8	26.7	32.5	29.5	31.4	30.3	21.7
USSR										
Million US$	$359.2	$480.3	$541.7	$581.1	$664.3	$706.6	$776.7	$828.6	NA	NA
Thousand units	41,3	46.5	48.9	50.5	51.9	54.3	55.4	56.3	57.2	58.4

NA - Not Available.

(a) Power-driven metal forming machine tools that are not supported in the hands of an operator when in use and are designed to press, forge, emboss, hammer, extrude, blank, spin, shear, and bend metal into shape.

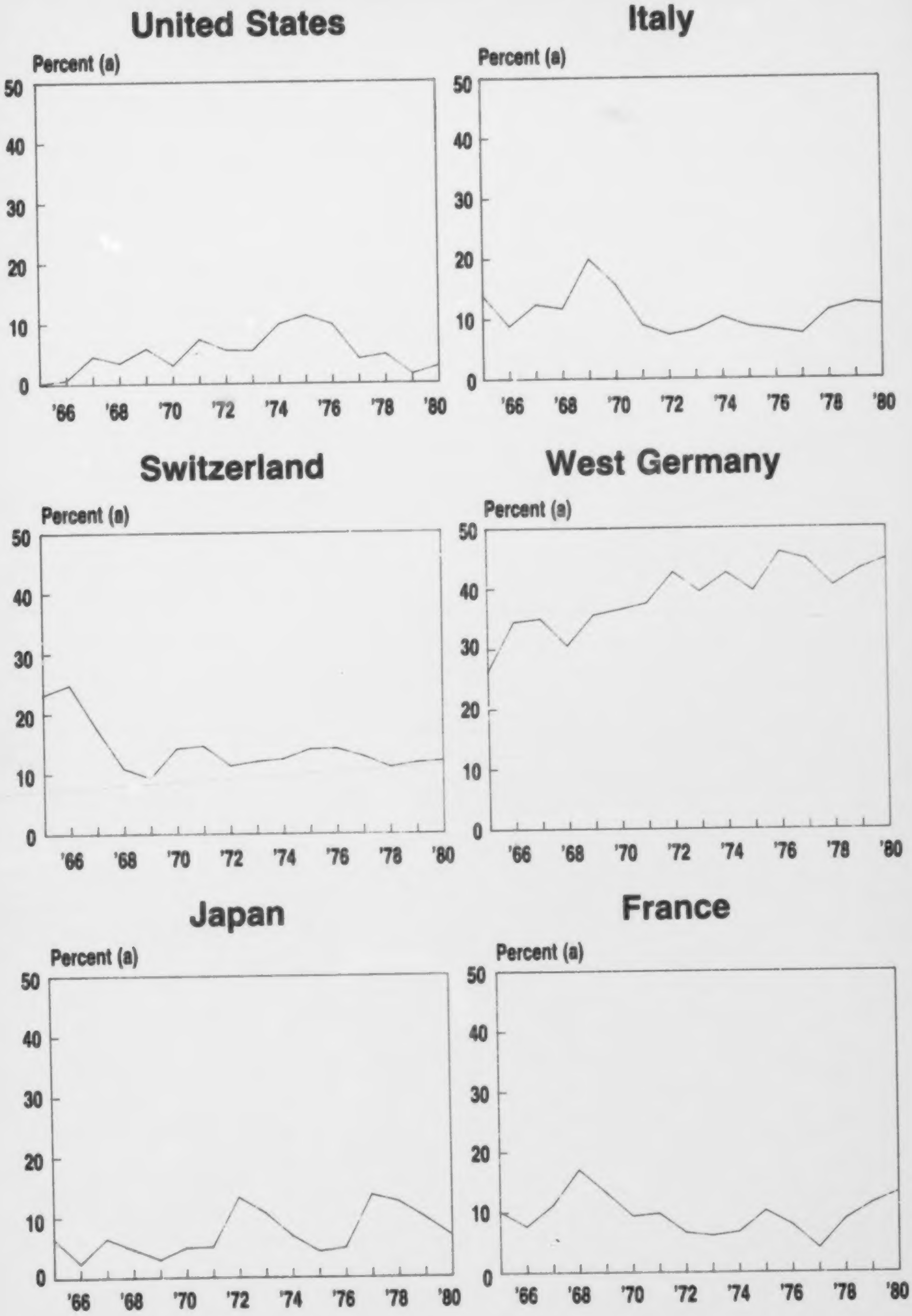
(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1982."

Eastern Bloc Machine Tool Imports

From Six Leading Non-Communist Nations



(a) Percent of total Eastern Bloc Imports from non-communist countries.

Source: U.S. Dept. of Commerce.

EASTERN BLOC (a) MACHINE TOOL IMPORTS
FROM 14 MAJOR NON-COMMUNIST TRADING NATIONS (b)
Total and Selected Nations, 1962 to Date

(Values in Millions of U.S. Dollars)

Year	Total	United States		France		West Germany(e)		Italy		Japan		Switzerland	
		Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)
1962	$ 47.4	$ .5	1.1%	$ 4.0	8.4%	$ 16.2	34.2%	$ 11.3	23.8%	$ 1.0	2.1%	$ 5.7	12.0%
1963	67.4	.3	.4	6.3	9.3	19.0	28.2	12.9	19.1	2.8	4.2	7.7	11.4
1964	68.7	.2	.3	9.0	13.1	19.4	28.2	12.0	17.5	3.1	4.5	10.9	15.9
1965	60.9	.1	.2	6.2	10.2	16.0	26.3	8.5	14.0	4.0	6.6	14.1	23.2
1966	71.3	.5	.7	5.5	7.7	24.6	34.5	6.3	8.8	1.7	2.4	17.7	24.8
1967	93.6	4.3	4.6	10.5	11.2	32.8	35.0	11.6	12.4	6.1	6.5	16.5	17.6
1968	162.7	5.7	3.5	27.9	17.1	49.6	30.5	19.1	11.7	7.6	4.7	17.8	10.9
1969	307.3	18.1	5.9	40.9	13.3	109.3	35.6	61.1	19.9	9.3	3.0	28.7	9.3
1970	257.9	8.0	3.1	24.2	9.4	94.2	36.5	40.3	15.6	12.8	5.0	36.5	14.2
1971	201.2	14.8	7.4	19.8	9.8	75.5	37.5	18.0	8.9	10.2	5.1	29.3	14.6
1972	385.5	21.5	5.6	25.4	6.6	164.3	42.6	28.3	7.3	51.2	13.3	43.6	11.3
1973	597.8	32.6	5.5	36.5	6.1	235.7	39.4	48.6	8.1	63.9	10.7	71.5	12.0
1974	727.4	72.2	9.9	48.6	6.7	309.2	42.5	74.2	10.2	50.4	6.9	89.9	12.4
1975	899.6	102.1	11.3	82.1	10.2	355.2	39.5	77.6	8.6	38.7	4.3	125.9	14.0
1976	976.8	63.8	9.8	76.6	7.8	447.9	45.9	79.6	8.1	48.3	4.9	138.0	14.1
1977	1,127.8	46.6(d)	4.1	45.6	4.0	504.6	44.7	83.7	7.4	153.7	13.6	144.9	12.8
1978	1,331.3	63.3(e)	4.8	116.7	8.8	536.8	40.3	150.0	11.3	165.9(f)	12.5	145.9	11.0
1979	1,243.8	18.5(d)	1.5	141.9	11.4	534.9	43.0	155.6	12.5	111.8	9.8	145.9	11.7
1980	1,145.6	32.3(e)	2.8	151.4	13.2	511.8	44.7	138.3	12.1	78.4	6.8	137.6	12.0

NA - Not Available.

(a) Bulgaria, Czechoslovakia, E. Germany, Hungary, Poland. Rumania, and U.S.S.R.
(b) United States, Austria, Belgium-Luxembourg, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.
(c) Percent of total Eastern Bloc machine tool imports from non-communist countries.
(d) Does not include Bulgarian imports.
(e) Does not include East German imports.
(f) Does not include Czechoslovakian imports.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools For Working Metals; and NMTBA.

COMMUNIST COUNTRIES' EXPORTS OF MACHINERY (a)

1973 to Date

(Millions of U.S. Dollars)

Exporting Country	Total (b)	Exported to					
		Communist Countries (c)	Free Europe (Incl. Yugosl.)	U.S., Canada, Japan	Africa (Excl. S. Afr.)	Asia (d)	Latin America (e)
TOTAL							
1973	$ 9,143	$6,917	$636	$48	$298	$ 867	$284
1974	10,606	8,228	759	71	319	986	88
1975	12,401	9,323	929	80	341	1,067	117
1976	14,050	11,130	580	40	218	587	97
1977	15,605	12,726	665	45	250	785	110
U.S.S.R.							
1973	2,718	1,541	245	3	170	491	182
1974	3,357	2,249	232	10	154	555	11
1975	355[illegible]	2,051	252	17	136	540	22
1976	3,953	2,952	127	3	96	303	23
1977	4,759	3,538	153	3	115	28	
East Germany							
1973	2,254	1,959	123	11	45	78	37
1974	2,507	2,181	152	12	42	92	26
1975	2,972	2,615	169	9	36	114	24
1976	3,458	2,957	135	4	50	104	25
1977	3,833	3,328	150	5	54	104	27
Czechoslovakia							
1973	1,774	1,404	128	16	54	134	35
1974	1,973	1,511	169	22	81	153	32
1975	2,303	1,776	195	20	106	162	41
1976	2,700	2,032	130	8	38	113	28
1977	2,972	2,237	143	9	41	124	32
Poland							
1973	578	438	68	9	10	48	5
1974	641	454	96	17	9	54	10
1975	836	576	145	19	14	63	19
1976	1,124	855	91	12	12	54	13
1977	1,335	1,015	109	14	14	64	15
Hungary							
1973	587	514	22	1	3	41	6
1974	689	597	35	1	3	49	5
1975	910	749	74	1	5	77	4
1976	895	752	33	1	3	31	5
1977	1,055	886	38	1	3	37	6
Romania							
1973	388	269	34	7	11	59	8
1974	437	293	49	8	22	61	3
1975	561	372	58	13	30	83	4
1976	440	215	37	13	15	58	2
1977	495	242	42	14	16	65	2
Bulgaria							
1973	844	792	18	1	5	16	11
1974	1,002	943	26	1	8	22	1
1975	1,266	1,185	36	1	13	30	1
1976	1,481	1,358	27	1	6	23	1
1977	1,615	1,480	30	1	6	26	1

(a) Note that these figures are for machinery in general and not for machine tools only.

(b) Total includes Australia, New Zealand, South Africa and not specified.

(c) U.S.S.R., East Germany, Czechoslovakia, Poland, Hungary, Romania, Bulgaria, Albania; beginning with 1974 includes Cuba and Outer Mongolia.

(d) Excluding Japan; beginning with 1974 excludes Outer Mongolia.

(e) Beginning with 1974 excludes Cuba.

Source: Verein Deutscher Maschinenbau-Anstalten, VDMA, "Statistisches Handbuch für den Maschinenbau" (annually).

7

EMPLOYMENT AND EARNINGS

As detailed in Chapter 3, the U.S. machine tool industry is characterized by a larger number of small and medium sized firms and relatively few large firms. Total employment at the end of 1982 was 68,600. If these employees had worked for a single firm, the U.S. machine tool industry—ranked by employment—would have been 42nd on the 1982 Fortune 500 of industrial corporations.

Employment fluctuates sharply with the fluctuations in new orders and shipments. Evidence of this is provided not only by the employment statistics but also by the labor turnover data in this chapter. These fluctuations create serious problems for the industry and for its employees. If employment has to be cut drastically, some of the highly skilled labor force is lost. When business experiences a quick upturn, there is a shortage of skilled workers. Extensive overtime is characteristic of the industry when orders are high.

To fill the gap in skilled workers, the industry sponsors training programs and NMTBA's Training Director assists Association members in solving a variety of manpower problems. However, the work force is getting older and it is becoming increasingly difficult to maintain a core of skilled workers.

Wages in the industry are competitive with those in comparable industries. Average hourly earnings for production workers in the metal cutting machine tool segment were $9.79 in 1982. Average earnings in the metal forming sector of the industry were $9.97. The average weekly hours worked by production workers in the industry were 38.9 for metal cutting workers and 38.0 for metal forming workers.

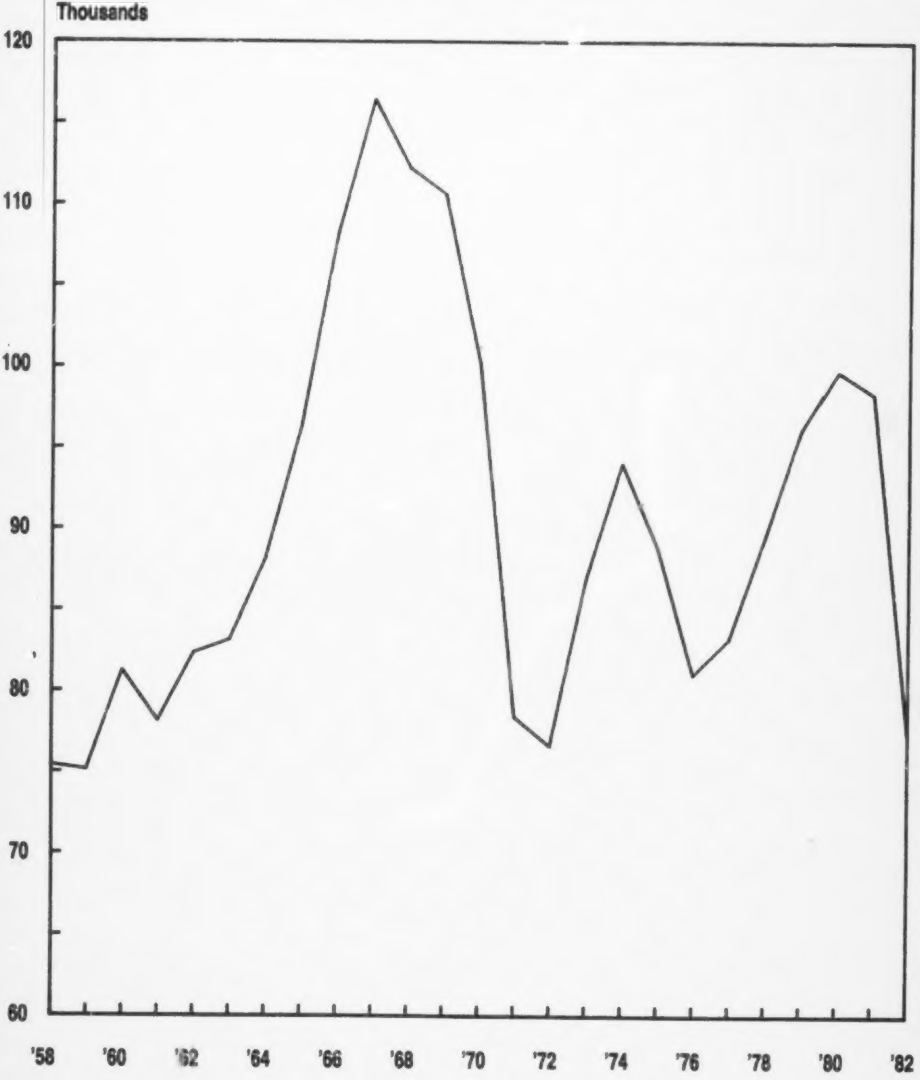
Work injury rates in metal cutting machine tool establishments are substantially lower, in lost workday cases, than the average for all manufacturing industries. The NMTBA Safety Director works closely with government agencies, industry members, and major industry customers to solve problems affecting safety and health.

Total compensation in the metal and metalworking industries in other countries has grown more rapidly than in the U.S. and in some cases is approaching equivalence. When the focus is narrowed to machine tools only, the total compensation of workers in the U.S. machine tool industry is still the highest among the major machine tool producing nations.

Most of the data in this chapter comes from the U.S. Bureau of Labor Statistics; some is from the U.S. Bureau of the Census. The regular Census data are based on complete enumerations of all workers covered; most other data are based on sample surveys. For definitions and further explanations of the terms used in this chapter see the Glossary at the end of this book.

Employment in the Machine Tool Industry

1958 to Date



Note: Estimate by NMTBA for 1977 and 1978.

Sources: U.S. Bureau of the Census. "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
1937 to Date

	Machine Tool Total		Metal Cutting		Metal Forming	
Year	All Employees	Production Workers	All Employees	Production Workers	All Employees	Production Workers
1937	NA	NA	NA	37,477	NA	NA
1939	NA	NA	NA	36,997	NA	NA
1947	NA	NA	70,001	54,435	NA	NA
1949	NA	NA	52,384	38,584	NA	NA
1950	NA	NA	54,747	41,555	NA	NA
1951	NA	NA	83,855	64,029	NA	NA
1952	NA	NA	102,735	79,471	NA	NA
1953	NA	NA	99,494	76,840	NA	NA
1954	NA	NA	80,959	62,106	NA	NA
1955	NA	NA	77,063	58,600	NA	NA
1956	NA	NA	85,469	65,208	NA	NA
1957	NA	NA	79,895	59,600	NA	NA
1958	75,366	51,726	52,864	36,154	22,502	15,572
1959	75,091	53,332	52,797	35,436	22,294	17,896
1960	81,200	57,439	58,777	39,467	22,423	17,952
1961	78,108	54,633	54,901	36,373	23,207	18,260
1962	82,251	57,662	58,855	39,253	23,396	18,409
1963	83,136	56,790	61,058	41,008	22,078	15,782
1964	88,079	61,196	65,078	44,471	23,001	16,725
1965	96,334	67,257	70,827	48,745	25,517	18,512
1966	108,174	76,190	79,767	55,279	28,407	20,911
1967	116,400	81,400	87,200	60,500	29,200	20,900
1968	112.200	76,900	84,300	57,500	27,900	19,400
1969	110,600	74,700	82,600	55,300	28,000	19,400
1970	100,200	65,900	71,300	45,800	28,900	20,100
1971	78,400	49,200	54,000	33,200	24,400	16,000
1972	76,600	50,000	52,500	33,400	24,100	16,600
1973	86,900	58,700	59,900	39,800	27,000	18,900
1974	94,000	64,200	65,000	43,900	29,000	20,300
1975	88,800	58,500	62,800	40,800	26,000	17,700
1976	81,000	53,500	58,100	37,600	22,900	15,900
1977	83,200	53,400	59,500	37,300	23,700	16,100
1978	89,500	59,200	64,300	42,200	25,200	17,000
1979	96,100	64,400	69,100	45,700	27,000	18,700
1980	99,700	66,000	72,800	47,800	26,900	18,200
1981(r)	98,300	63,900	74,300	47,900	24,000	16,000
1982E	77,404	50,316	58,505	37,717	18,898	12,599

NA - Not Available. E - Estimate by NMTBA. r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	81,200	$ 523.0	57,439	116.7	$ 324.7
1962	82,251	573.8	57,662	118.2	344.5
1964	88,079	678.0	61,196	135.2	428.4
1966	108,174	918.3	76,190	171.2	591.7
1968	112,200	1,001.0	76,900	163.1	619.7
1969	110,600	1,062.2	74,700	158.4	649.5
1970	100,200	965.3	65,900	136.6	572.6
1971	78,400	774.6	49,200	97.4	428.7
1972	76,600	839.2	50,000	103.3	489.7
1973	86,900	1,033.0	58,700	125.1	623.0
1974	94,000	1,245.2	64,200	135.8	748.0
1975	88,800	1,193.4	58,500	117.5	695.2
1976	81,000	1,182.2	53,500	105.5	688.1
1977	83,200	1,311.7	53,400	109.4	761.6
1978	89,500	1,536.3	59,200	123.3	932.8
1979	96,100	1,789.7	64,400	133.4	1,092.0
1980	99,700	2,018.1	66,000	134.0	1,202.7
1981	98,300	2,129.8	63,900	129.3	1,259.0

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufacturers."

EMPLOYMENT AND COMPENSATION
Metal Forming Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	22,423	$152.1	17,952	35.8	$100.9
1962	23,396	172.0	18,409	37.0	109.5
1964	23,001	180.3	16,725	37.9	121.6
1966	28,407	244.9	20,911	47.4	164.2
1968	27,900	245.8	19,400	42.9	157.4
1969	28,000	270.6	19,400	42.4	172.0
1970	28,900	280.6	20,100	43.4	177.3
1971	24,400	241.5	16,000	32.9	142.5
1972	24,100	265.4	16,600	34.7	163.8
1973	27,000	323.6	18,900	41.8	205.1
1974	29,000	370.8	20,300	43.3	238.2
1975	26,000	343.1	17,700	35.8	208.2
1976	22,900	336.8	15,900	32.0	214.2
1977	23,700	360.7	16,100	32.8	219.4
1978	25,200	415.6	17,000	35.1	253.2
1979	27,000	485.6	18,700	37.5	305.1
1980	26,900	514.1	18,200	35.2	313.2
1981	24,000	496.8	16,000	30.8	294.9

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Metal Cutting Machine Tool Industry
1937 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-Hours (Million)	Wages (Million $)
1937	NA	NA	37,477	NA	$ 62.6
1939	NA	NA	36,997	NA	62.9
1947	70,001	$ 234.0	54,435	113.4	165.0
1949	52,384	190.4	38,584	74.5	120.0
1950	54,747	226.8	41,555	88.6	150.6
1951	83,855	396.4	64,029	155.7	281.0
1952	102,735	524.5	79,471	194.6	385.3
1953	99,494	537.6	76,840	175.3	392.6
1954	80,959	432.3	62,106	133.2	302.7
1955	77,063	426.8	58,600	128.1	297.2
1956	85,469	511.9	65,200	147.5	360.6
1957	79,895	470.9	59,600	125.4	319.3
1958	52,864	300.3	35,154	69.6	182.2
1959	52,797	329.5	36,436	72.2	202.0
1960	58,777	370.9	39,487	80.9	223.8
1961	54,901	353.0	36,373	72.7	201.5
1962	58,855	401.8	39,253	81.2	235.0
1963	61,058	438.2	41,008	86.5	272.2
1964	65,078	497.7	44,471	97.3	306.8
1965	70,827	565.0	48,745	108.1	353.7
1966	79,767	673.4	55,279	123.8	427.5
1967	87,200	759.9	60,500	131.8	476.5
1968	84,300	755.2	57,500	120.2	462.3
1969	82,600	791.6	55,300	116.0	477.5
1970	71,300	684.7	45,800	93.2	395.3
1971	54,000	533.1	33,200	64.5	286.2
1972	52,500	573.8	33,400	68.2	325.9
1973	59,900	709.4	39,800	83.3	417.9
1974	65,000	874.4	43,900	92.5	509.8
1975	62,800	850.3	40,800	81.7	406.8
1976	58,100	845.4	37,600	73.5	473.9
1977	59,500	951.0	37,300	76.6	542.2
1978	64,300	1,120.7	42,200	88.2	679.6
1979	69,100	1,304.1	45,700	95.9	786.9
1980	72,800	1,504.0	47,800	98.8	889.5
1981	74,300	1,633.0	47,900	98.5	964.1

NA - Not Available.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey [illegible] nufactures."

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Metal Cutting Machine Tool Industry
Monthly, 1980 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1980 (r)	1981 (r)	1982	1980 (r)	1981 (r)	1982
Jan.	55.1	53.8	46.9	44.9	43.7	40.7
Feb.	55.4	53.2	46.3	45.0	43.0	40.6
Mar.	55.4	53.3	45.1	44.4	43.3	39.7
Apr.	55.7	53.0	43.2	44.0	42.0	39.3
May	56.1	52.2	41.2	43.9	42.3	38.9
June	55.0	52.2	38.7	43.5	42.1	38.7
July	55.2	51.5	35.4	41.1	41.3	38.8
Aug.	53.6	50.9	34.7	42.2	41.4	37.8
Sept.	53.0	51.6	33.5	43.1	41.3	37.8
Oct.	53.2	50.8	31.2	43.0	41.2	36.8
Nov.	54.1	49.0	30.8	44.0	41.5	37.4
Dec.	54.0	48.3	29.8	44.9	42.1	38.6
Yearly Avg.	54.7	51.7	37.9	43.7	42.1	38.9

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

LABOR TURNOVER IN THE METAL CUTTING MACHINE TOOL INDUSTRY
1959 to 1981

	Total Accessions	Total Separations	New Hires	Quits	Layoffs
Year	Per 100 Employees (a)				
1959	3.4	1.9	1.5	.7	.8
1960	1.9	2.4	1.3	.7	1.2
1961	2.0	1.9	1.1	.6	.9
1962	2.0	1.7	1.5	.8	.5
1963	1.8	1.6	1.5	.7	.4
1964	2.2	1.6	1.9	.9	.2
1965	2.5	1.8	2.3	1.2	.1
1966	3.1	2.4	2.9	1.7	.1
1967	2.4	2.3	2.1	1.5	.2
1968	1.8	2.4	1.5	1.4	.5
1969	2.3	2.3	2.0	1.4	.3
1970	1.4	4.0	.9	.9	2.4
1971	1.7	2.8	.6	.6	1.7
1972	2.6	2.0	1.6	.9	.5
1973	3.2	2.3	2.9	1.4	.1
1974	2.4	2.1	2.2	1.3	.2
1975	1.1	2.5	.6	.6	1.3
1976	1.9	1.6	1.0	.6	.5
1977	1.9	1.7	1.5	.8	.4
1978	2.1	1.7	1.8	.9	.2
1979	2.4	1.7	2.1	1.0	.1
1980	1.6	1.5	1.4	.7	.3
1981	1.0	1.6	.8	.6	.6

(a) Data relates to "All Employees".

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics. 1909-70" (also monthly).

EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

Monthly, 1981 to Date

(Employment in Thousands)

Month	1981 (r)	% Change 1980:1981	1982	% Change 1981:1982
Jan.	81.3	−0.1	73.9	-9.1
Feb.	81.0	−1.2	73.3	−9.5
Mar.	81.0	−1.3	72.2	−10.9
Apr.	80.7	−2.5	70.1	−13.1
May	79.9	−4.0	67.5	−15.5
June	80.2	−2.2	63.9	−20.3
July	79.7	−3.7	59.5	−25.3
Aug.	79.2	−4.1	59.1	−25.4
Sept.	79.6	0.0	57.1	−28.3
Oct.	78.8	−1.5	54.0	−31.5
Nov.	76.5	−6.1	52.8	−31.0
Dec.	75.8	−6.9	51.5	−32.1
Yearly Avg.	79.5	−2.6	62.6	−21.3

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY

1958 to Date

(Average Annual Employment in Thousands)

Year	All Employees	Production Workers	Female Employees
1958	64.7	43.8	6.3
1959	64.8	44.3	6.0
1960	69.5	48.2	6.5
1961	63.3	42.8	5.9
1962	63.7	43.7	5.8
1963	63.6	44.0	5.7
1964	67.1	46.7	5.8
1965	72.8	50.8	6.2
1966	79.4	55.7	7.1
1967	83.3	57.9	7.9
1968	80.0	54.5	7.6
1969	77.4	52.2	7.4
1970	69.2	45.5	6.8
1971	54.9	34.9	5.4
1972	55.8	35.8	5.5
1973	63.7	42.6	6.4
1974	67.8	45.6	7.1
1975	63.3	41.8	6.5
1976	59.9	38.8	6.4
1977	65.2	41.9	7.3
1978	70.9	45.9	8.4
1979	77.4	51.2	9.7
1980(r)	81.6	54.7	10.6
1981(r)	79.5	51.7	10.6
1982(p)	62.6	37.9	8.5

r - Revised.   p - Preliminary.

Note: The figures published by the Bureau of Labor Statistics are based on sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Metal Forming Machine Tool Industry
Monthly, 1980 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1980	1981	1982	1980	1981	1982
Jan.	18.1	15.8	14.8	42.8	40.2	37.4
Feb.	18.0	15.6	14.5	42.6	40.1	38.8
Mar.	18.0	15.5	14.2	43.6	40.0	38.6
Apr.	18.0	15.3	13.7	41.5	39.7	37.9
May	17.5	15.4	13.2	41.8	40.1	37.3
June	17.4	15.4	12.5	40.9	39.7	37.9
July	16.8	15.2	12.2	38.8	37.6	37.2
Aug.	16.5	14.3	11.7	39.5	38.2	37.1
Sept.	16.2	14.4	11.1	40.1	39.1	36.9
Oct.	15.8	15.3	10.4	40.1	38.4	38.5
Nov.	15.9	15.3	10.1	40.9	39.3	38.4
Dec.	15.9	15.4	9.8	40.6	39.0	39.8
Yearly Avg.	17.0	15.2	12.3	41.2	39.3	38.0

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (monthly).

EMPLOYMENT IN THE METAL FORMING MACHINE TOOL INDUSTRY
1977 to Date
(Average Annual Employment in Thousands)

Year	All Employees	Production Workers	Female Employees
1977	23.3	15.4	NA
1978	25.0	16.5	NA
1979	26.9	17.7	NA
1980	26.4	17.0	NA
1981	24.3	15.2	NA
1982	20.5	12.3	NA

Note: The figures published by the Bureau of Labor Statistics are based on sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics" (annual and monthly).

HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS
Metalworking and Metal Cutting Industries, 1936 to Date

Year	Metalworking Machinery Industry Average Weekly Earnings	Metalworking Machinery Industry Average Weekly Hours	Metalworking Machinery Industry Average Hourly Earnings	Metal Cutting Machine Tool Industry Average Weekly Earnings	Metal Cutting Machine Tool Industry Average Weekly Hours	Metal Cutting Machine Tool Industry Average Hourly Earnings
1936	NA	NA	NA	$ 28.73	44.4	$ .65
1937	NA	NA	NA	32.48	44.8	.73
1938	NA	NA	NA	26.75	36.0	.74
1939	NA	NA	NA	32.34	42.5	.76
1940	NA	NA	NA	37.44	48.0	.78
1941	NA	NA	NA	44.22	51.6	.86
1942	NA	NA	NA	52.70	53.5	.99
1943	NA	NA	NA	55.11	50.7	1.09
1944	NA	NA	NA	58.19	50.6	1.15
1945	NA	NA	NA	57.14	47.9	1.19
1946	NA	NA	NA	54.40	42.8	1.27
1947	$ 58.69	42.5	$1.38	57.87	42.3	1.37
1948	63.13	42.4	1.49	61.68	42.1	1.47
1949	61.33	39.8	1.54	59.23	39.2	1.51
1950	71.73	43.5	1.65	69.87	43.1	1.62
1951	86.01	47.4	1.83	85.14	47.3	1.80
1952	92.20	46.8	1.97	90.24	47.0	1.92
1953	96.81	46.1	2.10	95.17	46.2	2.06
1954	93.09	42.9	2.17	89.25	42.5	2.10
1955	98.34	43.9	2.24	95.48	43.6	2.19
1956	108.96	45.4	2.40	106.25	45.6	2.33
1957	106.89	43.1	2.48	101.04	42.1	2.40
1958	102.00	40.0	2.55	91.20	38.0	2.40
1959	113.74	42.6	2.67	106.93	42.1	2.54
1960	117.27	42.8	2.74	110.99	42.2	2.63
1961	117.04	41.8	2.80	111.92	41.3	2.71
1962	125.57	43.3	2.90	119.41	42.8	2.79
1963	128.90	43.4	2.97	124.42	43.2	2.88
1964	137.06	44.5	3.08	132.04	44.3	2.98
1965	144.37	45.4	3.18	138.76	45.2	3.07
1966	153.72	46.3	3.32	150.20	46.5	3.23
1967	154.56	44.8	3.45	154.25	45.5	3.39
1968	158.70	43.6	3.64	152.65	43.0	3.55
1969	172.38	44.2	3.90	166.61	43.5	3.83
1970	174.28	42.3	4.12	166.00	41.5	4.00
1971	174.62	40.8	4.28	163.90	39.4	4.16
1972	198.29	43.2	4.59	194.71	42.7	4.56
1973	214.90	44.4	4.84	219.11	44.9	4.88
1974	225.33	43.5	5.18	232.74	44.5	5.23
1975	226.46	41.1	5.51	232.68	42.0	5.54
1976	248.69	41.9	5.94	249.96	41.8	5.98
1977	279.72	43.1	6.49	290.18	43.9	6.61
1978	308.88	44.0	7.02	322.56	44.8	7.20
1979	329.30	43.5	7.57	344.21	44.3	7.77
1980(r)	346.83	42.4	8.18	366.21	43.7	8.38
1981(r)	371.49	41.6	8.93	383.95	42.1	9.12
1982	377.94	39.7	9.52	380.83	38.9	9.79

NA - Not Available. r - Revised.

Note: Earnings figures include overtime and premium pay.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1936 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1936	$ 23.72	NA	$ 30.13	NA	NA	$ 28.73
1937	26.61	NA	32.66	NA	NA	32.48
1938	23.70	NA	30.59	NA	NA	26.75
1939	28.19	NA	33.58	NA	NA	32.34
1940	28.07	NA	36.69	NA	NA	37.44
1941	33.56	NA	42.68	NA	NA	44.22
1942	42.17	NA	54.15	NA	NA	52.70
1943	48.73	NA	59.13	NA	NA	55.11
1944	51.38	NA	60.12	NA	NA	58.19
1945	48.36	NA	55.28	NA	NA	57.14
1946	46.22	NA	52.28	NA	NA	54.40
1947	51.76	$ 57.58	58.63	$ 54.74	$ 58.69	57.87
1948	56.36	60.38	63.15	60.97	63.13	61.68
1949	57.25	60.31	67.33	63.3[illegible]	61.33	59.23
1950	62.43	67.[illegible]8	74.85	68.10	71.73	69.87
1951	68.48	76.13	77.16	77.96	86.01	85.14
1952	72.63	79.55	84.87	81.27	92.20	90.24
1953	76.63	82.68	89.88	83.38	96.81	95.17
1954	76.19	81.40	91.30	84.66	93.09	89.25
1955	82.19	87.36	99.84	89.21	98.34	95.48
1956	85.28	93.06	96.82	95.57	108.96	106.25
1957	88.26	94.12	100.61	96.35	106.89	101.04
1958	89.27	94.33	101.24	101.25	102.00	91.20
1959	96.05	102.92	111.38	106.63	113.74	106.93
1960	97.44	104.55	115.21	110.43	117.27	110.99
1961	100.35	107.42	114.65	114.68	117.04	111.92
1962	104.70	113.01	127.67	119.97	125.57	119.41
1963	108.09	116.20	132.68	122.43	128.90	124.42
1964	112.19	121.69	138.03	125.03	137.06	132.01
1965	117.16	127.58	147.63	131.88	144.37	138.76
1966	122.09	135.34	147.23	143.32	153.72	150.20
1967	123.60	135.89	144.84	146.97	154.56	154.25
1968	132.07	141.88	167.66	152.04	158.70	152.65
1969	139.59	152.15	170.56	161.35	172.38	166.61
1970	143.47	154.95	170.47	168.92	174.28	166.00
1971	153.52	161.99	195.29	175.82	174.62	163.90
1972	167.27	179.34	219.22	193.44	198.29	194.71
1973	179.28	193.83	237.08	207.50	214.90	219.11
1974	190.48	207.62	239.54	218.70	225.33	232.74
1975	205.09	219.22	262.68	246.19	226.46	232.68
1976	225.33	236.74	305.30	263.16	248.89	249.96
1977	248.46	259.79	345.40	289.95	279.72	290.18
1978	270.44	285.44	368.05	318.19	308.88	322.56
1979	290.90	305.98	372.37	351.05	329.30	344.21
1980(r)	310.78	328.00	394.00	389.76	346.83	366.21
1981(r)	342.91	360.33	450.31	425.80	371.49	383.95
1982	355.67	367.49	469.80	462.38	377.94	380.83

NA - Not Available. r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1936 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1936	$ .58	NA	$ .76	NA	NA	$ .65
1937	.67	NA	.88	NA	NA	.73
1938	.68	NA	.91	NA	NA	.74
1939	.69	NA	.92	NA	NA	.76
1940	.72	NA	.94	NA	NA	.78
1941	.80	NA	1.04	NA	NA	.86
1942	.94	NA	1.17	NA	NA	.99
1943	1.05	NA	1.24	NA	NA	1.09
1944	1.11	NA	1.27	NA	NA	1.15
1945	1.10	NA	1.27	NA	NA	1.19
1946	1.14	NA	1.35	NA	NA	1.27
1947	1.28	$ 1.34	1.47	$ 1.37	$1.38	1.37
1948	1.40	1.46	1.61	1.49	1.49	1.47
1949	1.45	1.52	1.70	1.56	1.54	1.51
1950	1.52	1.60	1.78	1.64	1.65	1.62
1951	1.65	1.75	1.91	1.78	1.83	1.80
1952	1.75	1.85	2.05	1.89	1.97	1.92
1953	1.86	1.95	2.14	1.99	2.10	2.06
1954	1.90	2.00	2.20	2.07	2.17	2.10
1955	1.99	2.08	2.29	2.16	2.24	2.19
1956	2.08	2.20	2.35	2.27	2.40	2.33
1957	2.19	2.29	2.46	2.35	2.48	2.40
1958	2.26	2.37	2.55	2.50	2.55	2.40
1959	2.36	2.48	2.71	2.62	2.67	2.54
1960	2.43	2.55	2.81	[illegible]	2.74	2.63
1961	2.49	2.62	2.86	2.77	2.80	2.71
1962	2.56	2.71	2.99	2.87	2.90	2.79
1963	2.63	2.78	3.10	2.95	2.97	2.88
1964	2.71	2.87	3.21	3.02	3.08	2.98
1965	2.79	2.96	3.34	3.14	3.18	3.07
1966	2.90	3.09	3.44	3.31	3.32	3.23
1967	3.00	3.19	3.55	3.45	3.45	3.39
1968	3.19	3.37	3.89	3.62	3.64	3.55
1969	3.38	3.58	4.10	3.86	3.90	3.83
1970	3.56	3.77	4.23	4.12	4.12	4.00
1971	3.80	3.99	4.74	4.32	4.28	4.16
1972	4.05	4.27	5.11	4.65	4.59	4.56
1973	4.32	4.55	5.45	5.00	4.84	4.88
1974	4.68	4.92	5.90	5.40	5.18	5.23
1975	5.14	5.36	6.47	5.99	5.51	5.54
1976	5.55	5.76	7.10	6.45	5.94	5.98
1977	6.06	6.26	7.85	6.92	6.49	6.61
1978	6.58	6.78	8.50	7.54	7.02	7.20
1979	7.13	7.32	9.06	8.26	7.57	7.77
1980(r)	7.75	8.00	9.85	9.28	8.18	8.38
1981(r)	8.53	8.81	11.01	10.31	8.93	9.12
1982	9.05	9.28	11.60	11.25	9.52	9.79

NA - Not Available.   r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-70" (also monthly).

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)
In Selected Areas by Occupation, 1974-75, 1978, 1981

Region and Survey Year	Occupation				
	Machine Tool Operators, Production				
	Class A (b)	Class B (c)	Class C (d)	Numerically Controlled	Tool Room One Type Machine
1. Baltimore, Md.					
Winter 1974-75	$ 5.17	$4.60	$3.97	$ 5.06	$ 5.21(e)
Jan. 1978	6.74	5.79	5.24	5.67	6.54(e)
Jan. 1981	9.01	7.84	7.01	7.66	NA
2. Boston, Mass.					
Winter 1974-75	5.04	4.15	3.58	4.66	5.76
Jan. 1978	6.54	6.01	4.71	6.24	6.72
Jan. 1981	8.59	8.35	5.87	8.44	NA
3. Buffalo, N.Y.					
Winter 1974-75	5.16	4.76	4.19	5.56	5.43
Jan. 1978	6.77	6.28	5.44	7.00	6.80
Jan. 1981	8.97	8.25	7.01	9.47	7.74
4. Chicago, Ill.					
Winter 1974-75	5.71	5.02	4.49	5.59	6.20
Jan. 1978	7.38	6.51	5.90	7.55	8.36
Jan. 1981	9.60	8.00	6.63	9.51	11.31
5. Cleveland, Ohio					
Winter 1974-75	5.68	4.75	3.84	5.68	5.80
Jan. 1978	7.02	6.01	4.12	7.17	7.09
Jan. 1981	9.43	8.13	6.78	9.37	9.66
6. Denver, Colo.					
Winter 1974-75	5.53	4.43	3.78	5.34	5.84(e)
Jan. 1978	6.60	5.36	5.04	6.44	6.63
Jan. 1981	9.30	7.23	NA	8.28	10.69
7. Detroit, Mich.					
Winter 1974-75	6.07	5.46	4.42	6.29	6.68
Jan. 1978	8.19	7.01	5.48	7.14	8.94
Jan. 1981	11.61	9.48	6.21	9.44	12.08
8. Houston, Tx.					
Winter 1974-75	5.40	5.01	3.91	5.50	5.31
Jan. 1978	7.15	6.66	4.89	7.29	7.26
Jan. 1981	9.92	NA	5.93	10.08	10.08
9. L.A.-Long Beach, Cal.					
Winter 1974-75	5.26	4.56	3.60	5.43	6.17
Jan. 1978	6.87	5.45	3.96	6.86	7.44
Jan. 1981	9.38	7.30	4.83	9.28	9.87
10. Milwaukee, Wis.					
Winter 1974-75	5.75	5.48	5.49	5.48	5.89
Jan. 1978	7.78	6.89	NA	7.43	7.86
Jan. 1981	10.47	9.91	8.45	10.36	11.35
11. Newark, N.J.					
Winter 1974-75	5.31	5.31	3.86	5.61	5.71
Jan. 1978	6.50	6.59	4.65	6.29	7.47
Jan. 1981	9.44	9.04	6.35	7.68	NA
12. Pittsburgh, Pa.					
Winter 1974-75	5.55	5.36	4.97	5.19	5.43
Jan. 1978	7.15	6.71	6.15	6.69	7.21(e)
Jan. 1981	9.44	8.80	8.14	9.33	NA
13. St. Louis, Mo.-Ill.					
Winter 1974-75	6.54	5.07	4.69	6.33	5.76
Jan. 1978	8.25	6.14	6.12	7.26	8.03
Jan. 1981	9.45	8.36	8.30	9.27	8.69

NA - Not Available.

(a) Nonelectrical Machinery (SIC 35).
(b) Operators who set up their own machines and perform a variety of machine operations to close tolerances using decisions based on blueprints and layouts.
(c) Operators who set up their own machines and maintain operation set-ups made by others.
(d) Operators who perform routine and repetitive operations but do not set up machines.
(e) More than one type of machine.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1974-75, 1978, 1981

(Continued)

	Occupation					
	Assemblers		Inspectors		Laborers, Material Handling	Tool Clerks
	Class A (f)	Class B (g)	Class A (h)	Class B (i)		
1.						
	$4.86	$4.39	$ 5.46	NA	$3.67	$4.07
	6.03	5.71	6.72	NA	5.13	5.38
	8.00	6.88	8.88	$7.72	7.21	NA
2.						
	4.86	3.97	4.97	4.32	3.66	4.52
	6.18	4.89	NA	5.26	4.56	5.73
	8.31	6.62	8.47	7.44	6.18	7.22
3.						
	5.29	4.73	5.54	5.04	4.36	4.43
	6.92	6.43	7.20	6.36	NA	5.86
	9.24	8.07	9.35	7.62	8.11	7.80
4.						
	5.35	4.58	5.51	5.15	4.30	4.68
	6.84	6.49	7.43	6.80	5.86	6.47
	8.95	7.43	9.25	8.56	6.81	9.10
5.						
	5.57	4.95	5.60	5.26	4.49	4.96
	7.21	6.13	7.20	6.65	6.07	6.50
	9.64	7.80	9.93	8.46	8.90	8.86
6.						
	4.90	3.81	5.14	4.03	3.58	4.38
	5.94	4.30	6.67	5.93	4.75	5.89
	7.79	5.40	8.55	7.04	5.89	7.54
7.						
	6.15	5.60	5.74	5.65	4.79	5.44
	7.80	7.23	7.79	6.50	6.94	7.13
	11.17	9.59	11.01	NA	9.45	9.80
8.						
	5.27	4.47	5.43	4.60	4.21	4.65
	6.89	5.86	7.37	6.43	5.38	6.36
	9.75	9.06	10.07	8.45	7.41	7.80
9.						
	4.71	3.88	5.38	4.30	3.82	4.58
	6.29	4.41	6.74	5.50	4.67	5.24
	8.02	6.09	9.77	7.20	5.74	6.93
10.						
	5.68	5.24	5.64	5.40	NA	4.77
	7.72	6.96	7.24	6.97	6.19	6.28
	10.31	9.09	9.99	NA	8.88	9.13
11.						
	5.28	4.21	4.87	4.92	4.02	4.85
	6.54	5.71	5.95	6.61	4.96	5.74
	7.93	5.90	7.83	7.77	7.21	6.60
12.						
	5.80	4.48	6.19	4.99	4.47	4.65
	7.14	6.02	7.37	6.66	5.33	6.18
	8.52	7.78	9.44	8.79	8.74	7.48
13.						
	5.78	4.70	6.23	5.03	4.17	4.62
	6.91	5.81	7.24	6.23	5.11	5.81
	9.10	7.57	9.04	8.35	6.79	7.86

(f) Fits and adjusts parts and makes decisions regarding proper performance of component or unit.

(g) Assembles parts in accordance with standard and prescribed procedures. Requires some fitting and adjusting.

(h) Responsible for decisions regarding quality of product and operations. Troubleshooting and interpreting of drawings and specifications is involved.

(i) Tests products and processes having rigid specifications with established inspection procedures.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

SELECTED LABOR RATIOS
1961 to Date

	Payroll per Employee	Prod. Wkrs. % of Total Employment	Annual Man-Hours of Prod. Workers	Average Hourly Earnings, Prod.Workers	Value Added Per Employee	Payroll as % of Value Added	Value Added per Man Hour of Prod. Wkrs.
METAL CUTTING MACHINE TOOL INDUSTRY							
1960	$ 6,310	67%	2,049	$2.77	$9,837	64%	$ 7.15
1961	6,429	66	1,999	2.77	10,020	64	7.57
1962	6,827	67	2,069	2.89	11,401	60	8.26
1963	7,171	67	2,109	3.14	11,445	62	8.08
1964	7,645	68	2,186	3.15	12,844	59	8.59
1965	7,980	68	2,219	3.27	14,033	56	9.19
1966	8,438	69	2,238	3.45	15,466	54	9.96
1967	8,714	69	2,178	3.61	15,955	54	10.55
1968	8,958	68	2,090	3.84	16,335	54	11.45
1969	9,583	66	2,097	4.11	17,451	54	12.42
1970	9,603	64	2,034	4.24	15,597	61	11.93
1971	9,872	61	1,942	4.43	15,181	65	12.71
1972	10,929	63	2,041	4.77	17,175	63	13.22
1973	11,843	65	2,092	5.01	20,268	58	14.57
1974	13,452	67	2,107	5.51	24,876	54	17.48
1975	13,539	64	2,002	5.95	26,119	51	20.07
1976	14,550	64	1,954	6.44	28,641	50	22.64
1977	15,983	63	2,054	7.08	31,445	51	24.43
1978	17,429	66	2,090	7.71	35,257	49	25.70
1979	18,873	66	2,098	8.21	41,010	46	29.55
1980	20,659	66	2,067	9.00	46,005	45	33.90
1981(p)	21,978	64	2,056	9.61	50,335	44	37.97
METAL FORMING MACHINE TOOL INDUSTRY							
1960	$ 6,785	80%	1,996	$2.82	$10,596	64%	$ 6.63
1961	6,818	79	1,905	2.91	9,552	71	6.37
1962	7,351	79	2,012	2.96	11,363	65	7.18
1963	7,316	71	2,189	3.10	12,728	57	8.13
1964	7,839	72	2,269	3.20	13,847	56	8.40
1965	8,058	72	2,243	3.34	13,686	58	8.40
1966	8,623	73	2,267	3.46	15,214	56	9.11
1967	8,547	71	2,210	3.57	1[illegible],972	57	9.46
1968	8,810	69	2,211	3.66	1[illegible],247	54	10.56
1969	9,664	69	2,185	4.05	16,182	59	10.68
1970	9,709	69	2,159	4.08	16,249	59	10.82
1971	9,897	65	2,056	4.33	14,913	66	11.06
1972	11,012	68	2,090	4.72	17,331	63	12.03
1973	11,985	70	2,211	4.90	20,240	59	13.07
1974	12,786	70	2,133	5.50	21,851	58	14.63
1975	13,196	68	2,022	5.81	23,780	55	17.27
1976	14,707	69	2,012	6.69	27,122	54	19.40
1977	15,219	68	2,037	6.69	30,460	50	22.01
1978	16,492	68	2,065	7.21	33,385	49	23.97
1979	17,985	69	2,005	8.14	37,185	48	26.77
1980	19,112	68	1,934	8.90	38,740	49	29.61
1981(p)	20,700	67	1,925	9.57	40,688	51	31.70

p - Preliminary.

Source: 1963, 1967, 1972, 1977: U.S. Bureau of the Census, "Census of Manufactures," 1977, Industry Series: "Metalworking Machinery and Equipment," MC 77-1-35C and earlier years. Other Years: U .S. Bureau of the Census, "Annual Survey of Manufactures" (Annually).

WEEKLY OVERTIME HOURS OF PRODUCTION WORKERS
Selected Industry Groups, 1957 to Date, Annual Averages

Year	Manufacturing	Durable Goods Industry	Nonelectrical Machinery Machinery Industry	Metalworking Machinery Industry
1957	2.3	2.4	2.8	NA
1958	2.0	1.9	1.8	2.5
1959	2.7	2.7	2.9	4.0
1960	2.4	2.4	2.7	4.3
1961	2.4	2.3	2.5	3.4
1962	2.8	2.8	3.1	4.7
1963	2.8	2.9	3.2	4.8
1964	3.1	3.3	3.9	5.9
1965	3.6	3.9	4.6	6.7
1966	3.9	4.3	5.5	7.8
1967	3.4	3.5	4.4	6.5
1968	3.6	3.8	4.0	5.4
1969	3.6	3.8	4.5	6.0
1970	3.0	2.9	3.2	4.3
1971	2.9	2.9	2.6	2.8
1972	3.5	3.6	3.8	4.9
1973	3.8	4.1	4.7	6.4
1974	3.2	3.4	4.3	5.8
1975	2.6	2.5	3.0	3.3
1976	3.1	3.1	3.1	4.0
1977	3.5	3.7	4.0	5.5
1978	3.6	3.8	4.3	5.9
1979	3.3	3.5	4.0	5.7
1980	2.8	2.8	3.4	4.8
1981	2.8	2.8	3.2	4.1
1982	2.3	2.2	2.2	2.7

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings", monthly and annual supplements.

WORK INJURY RATES
By Industry, 1981

Industry	Incidence Rates (per 100 Employees)			Average Lost Workdays Per Lost Workday Case
	Total Recordable Cases	Lost Workday Cases	Nonfatal Cases Without Lost Workdays	
Manufacturing	11.1	4.9	6.2	16.0
Fabricated Metal Products	17.0	7.3	9.7	15.0
Metal Stampings	17.7	7.1	10.5	15.0
Machinery Except Electrical	12.5	5.0	7.5	15.0
Engines and Turbines	10.3	4.5	5.8	18.0
Construction and Related Machinery	16.3	7.0	9.3	13.0
Metalworking Machinery	13.1	4.7	8.4	15.0
Machine Tools, Metal Cutting Types	13.6	5.1	8.4	15.0
Machine Tools, Metal Forming Types	17.0	6.1	10.8	15.0
Special Industry Machinery	14.5	5.4	9.1	14.0
General Industrial Machinery	14.0	5.7	8.3	15.0
Transportation Equipment	9.4	4.5	4.9	17.0
Motor Vehicles and Equipment	8.7	3.8	4.9	15.0

Note: Data represents work-related injuries and illnesses in comparable industries.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

AVERAGE HOURLY EARNINGS AMD SUPPLEMENTARY LABOR COST
In the Machine Tool Industry of the United States and Seven Foreign Countries

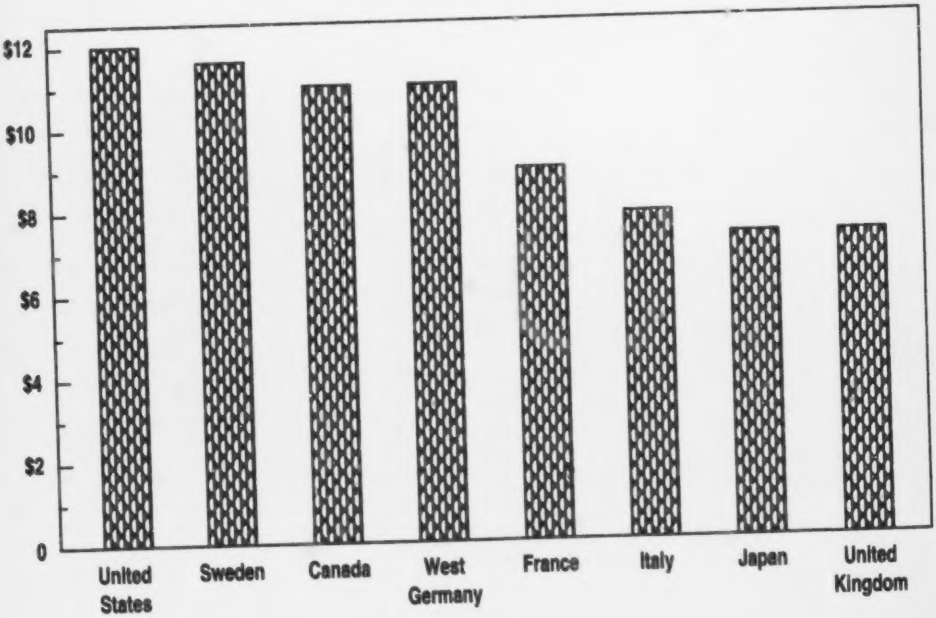
Country	Date	Industry	Workers Covered	Average Hourly Earnings	Estimated Supplementary Labor Cost	Total Compensation
Sweden	1981	(1)	P.W.	$7.01	$4.44	$11.45
France	1978	(1)	All	4.24	3.01	7.25
Germany (Federal Republic)	1979	(1)	P.W.	7.32	4.63	11.95
Italy	1979	(1)	P.W.	3.96	3.80	7.76
Switzerland	1980	(2)	P.W.	8.54	3.41	11.95
United Kingdom	1979	(1)	P.W.	4.46	1.30	5.76
Japan	1981	(1)	P.W.	5.98	1.03(3)	7.01
United States	1981	(1)	P.W.	8.93	2.96	11.89

P.W. - Production Workers.

(1) Machine Tools.
(2) Metals and Machines.
(3) Non-Electrical Machinery.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons. This table differs from the one shown in chapter 2 because it focuses directly on the machine tool industry compensation. The other table shows production woker compensation in manufacturing as a whole.

Average Hourly Compensation of Production Workers
Machinery, Except Electrical, 1981



AVERAGE HOURLY EARNINGS IN METAL AND METALWORKING INDUSTRIES
In Selected Countries, for Selected Years

Country	Industry	1975	1978	1979	1980	1981	Percent Increase 1975-81
Canada	(1)	$5.54	$6.43	$6.84	$7.55	NA	NA
France	(1)	2.97	4.12	4.90	5.72	$5.15	219.6%
Italy	(1)	3.22	NA	NA	NA	NA	NA
Japan	(1)	3.90	6.74	6.99	7.25	7.94	151.2
Switzerland	(2)	4.88	7.64	8.46	8.89	8.11	126.2
United Kingdom	(1)	3.07	3.72	4.82	6.14	5.84	209.8
United States	(1)	5.37	6.78	7.32	8.00	8.81	163.9
West Germany	(1)	4.22	6.16	7.13	7.69	6.48	140.5

(a) Men only.
(1) —Machinery, except electrical.
(2) —Metal products, machinery, etc.

Sources: "ILO 1979 Statistical Yearbook" ("Statistics of average earnings . . . usually cover cash payments received from employers, i.e., renumeration for normal working hours, payments for overtime and time not worked (holidays, vacation, etc.), production bonuses, cost-of-living allowances and special premiums . . .").

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS
In Selected Industry Groups, 1981 (a)

Country	All Manufacturing	Machinery, Except Electrical	Electrical Equipment	Motor Vehicles
United States	$10.96	$12.00	$10.61	$18.14
Canada	9.87	11.02	8.83	12.44
France	8.32	8.94	8.21	9.20
West Germany	10.54	10.98	10.11	13.02
Italy	7.48	7.85	7.34	7.59
Japan	6.18	7.21	5.62	7.54
Sweden	11.80	[illegible]	11.19	11.95
United Kingdom	7.12	7.29	6.82	7.64

(a) Preliminary estimates.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Make a free
investment
in the future.

Put NMTBA's new career recruitment film to wo
for you. It is available for use in your company's pe
sonnel development efforts, as well as in local hig
schools and vocational schools.

This colorful film shows young, successful meta
working industry employees—operators, programmer
assembly technicians, service engineers and supe
visors—describing their work, their career progress ar
their life styles. In addition, the motion picture cove
what machine tools are and their importance to o
nation's industrial achievements.

Collateral handout materials to reinforce the film
message are also available free of charge. To arrange f
free loan of the career information film, contact Mode
Talking Picture Service, Inc., Scheduling Center, 50
Park Street North, St. Petersburg, Florida 33709.

nm ba
nationa
machin
tool builder
associatio

The future of industry depends on new employees

8

FINANCE

Publicly available data on the financial status of the machine tool industry is scarce. A few sources are the annual reports of the publicly owned machine tool companies and of other companies that produce machine tools. Government statistics on the capital expenditures for "structures and additions" and for "machinery and equipment" in the metal cutting and metal forming machine tool industries are an indirect measure of financial health.

Selected financial indicators for a machine tool composite from the "Industry Surveys" of Standard and Poor's Corporation are included in this chapter. The machine tool composite combines data for six relatively large machine tool companies on the basis of the total market value of equity stock outstanding.

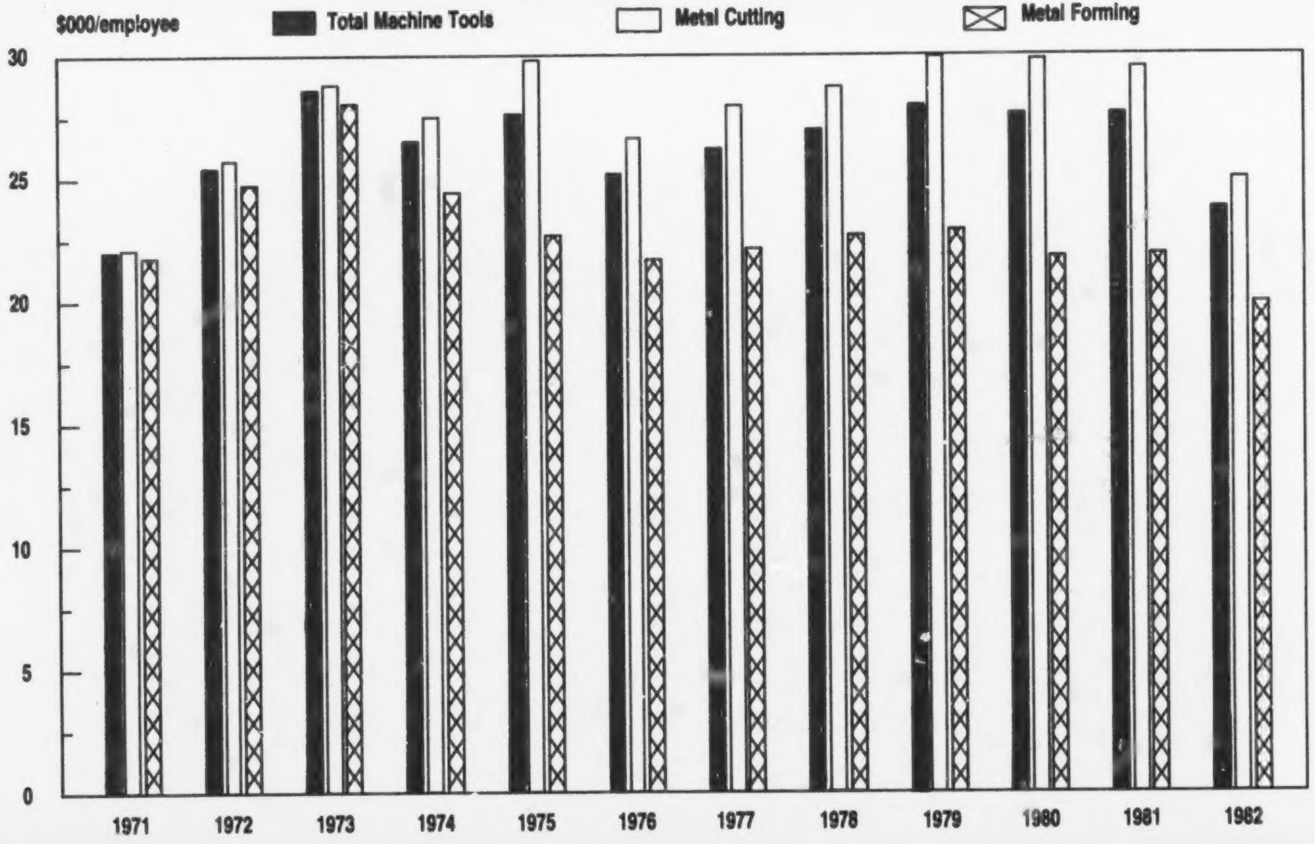
Each indicator from "Industry Surveys" is an index based on average value per share of outstanding stock. We have converted these indicators from the original base of 1941–1943 = 10 to 1967 = 100 to conform with other indexes in this publication. The financial indicators for the composite do not necessarily represent an average for the entire machine tool industry, but given the scarcity of financial information, are a valuable addition to this chapter.

Data collected by an outside research group for the National Machine Tool Builders' Association indicate that the rate of profit of machine tool manufacturers tends to be somewhat higher than that of all manufacturing industries during good times, but drastically worse in less prosperous periods.

It should be emphasized that all the data in this section are in current dollars and that in periods of rapid inflation the true state of earnings and capital accumulation is seriously distorted. In particular, overstatement of "inventory profits" and the understatement—relative to replacement costs—of depreciation charges on capital equipment.

Machine Tool Industry Productivity

(Constant Dollar Shipments Per Production Worker)



SELECTED FINANCIAL RATIOS FOR CORPORATIONS IN SELECTED INDUSTRIES, 1982

Industry	% Net Operating Profit on Sales	% Earnings After Taxes on Sales	% Earnings After Taxes On Net Worth	% Depreciation and Amortization on Net Sales	Times Inventory Turnover	Times Current Assets to Current Liabilities
Machine Tools	5.4	2.7	4.9	2.5	2.3	2.9
All Manufacturing Corporations	5.1	3.5	9.2	3.6	6.5	1.6
Durable Manufactures	4.1	2.4	6.1	3.9	4.9	1.7
Electrical Machinery	6.0	4.4	11.8	3.2	4.6	1.6
Machinery, Except Electrical	6.9	4.3	8.6	4.7	4.3	1.8
Motor Vehicles	0.4	0.6	2.1	5.1	9.5	1.1
Chemical and Allied Products	6.4	5.6	11.1	4.3	6.2	1.9

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Machine Tool Industry, 1962 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structure and Additions	Machinery and Equipment	Total	Structure and Additions	Machinery and Equipment
1962	$ 722	$ 519	NA	NA	$203	NA	NA
1963	743	531	NA	NA	212	NA	NA
1964	800	558	NA	NA	242	NA	NA
1965	NA	NA	NA	NA	NA	NA	NA
1966	NA	NA	NA	NA	NA	NA	NA
1967	1,099	800	$245	$ 555	299	$ 88	$211
1968	1,161	845	253	592	316	94	222
1969	1,224	889	269	620	335	98	237
1970	1,235	884	270	614	351	109	242
1971	1,241	874	272	602	367	114	253
1972	1,228	841	263	578	387	120	267
1973	1,251	851	259	592	400	121	279
1974	1,324	895	260	635	429	131	298
1975	1,356	937	266	671	419	125	294
1976	1,412	1,000	279	721	412	127	285
1977	1,478	1,035	295	740	443	129	314
1978	1,603	1,115	330	785	488	138	350
1979	1,899	1,333	372	961	566	160	406
1980	2,065	1,453	417	1,036	612	168	444
1981	2,263	1,627	463	1,164	636	180	456

NA - Not Available. r - Revised.

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures."

NEW CAPITAL EXPENDITURES IN THE MACHINE TOOL INDUSTRY

1954 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structure and Additions	Machinery and Equipment	Total	Structure and Additions	Machinery and Equipment
1954	NA	$ 37.7	$11.2	$ 26.5	NA	NA	NA
1955	NA	44.0	NA	NA	NA	NA	NA
1956	NA	49.2	NA	NA	NA	NA	NA
1957	NA	39.7	NA	NA	NA	NA	NA
1958	$ 30.5	18.8	1.9	16.9	$11.7	$ 3.8	$ 7.9
1959	31.9	22.2	NA	NA	9.7	NA	NA
1960	37.4	24.8	NA	NA	12.6	NA	NA
1961	26.4	18.7	NA	NA	7.7	NA	NA
1962	39.3	26.6	NA	NA	12.7(a)	NA	NA
1963	39.6	28.8	5.4	23.4	10.8	2.1	8.7
1964	71.7	41.7	11.0	30.7	30.0(a)	7.5(a)	22.5(a)
1965	74.2	53.7	10.2	43.5	20.5	4.4(a)	16.1
1966	102.5	74.9	17.1	57.8	27.6	6.2(a)	21.4(a)
1967	104.9	78.7	19.3	59.3	26.2	5.7	20.5
1968	90.9	62.3	9.1	53.2	28.6	7.7	20.9
1969	105.0	75.5	21.8	53.7	29.5	7.7	21.8
1970	72.7	49.3	11.7	37.6	23.4	7.8	15.6
1971	39.1	28.7	4.6	24.1	10.4	1.6	8.9
1972	52.7	35.2	7.2	28.0	17.5	4.7	12.8
1973	65.9	38.4	7.3	31.1	27.5	4.0	23.4
1974	93.3	58.9	10.6	48.3	34.4	8.6	25.9
1975	76.1	52.2	7.9	44.2	23.9	4.0	19.9
1976	93.5	65.2	11.2	54.0	28.3	10.8	17.5
1977	132.4	107.9	19.1	88.8	24.5	2.6	21.9
1978	142.4	102.0	22.4	79.6	40.4	5.8	34.6
1979	199.4	147.6	31.8	115.8	51.8	9.7	42.1
1980	241.0	171.6	39.8	131.8	69.4	14.5	54.9
1981	296.2	233.2	52.3	180.9	63.0	12.8	50.2

NA - Not Available.

(a) Standard errors exceeding 15%, not consistent with other Census data in metal forming.

Note: Change of definition of machine tool industry makes comparisons before 1957 difficult.

Source: U.S. Bureau of the Census, "Census of Manufactures", 1963, 1967, 1972, 1977; U.S. Bureau of the Census, "Annual Survey of Manufactures."

MACHINE TOOL FINANCIAL INDICATORS (a)
Per Share Data
(1967 = 100)

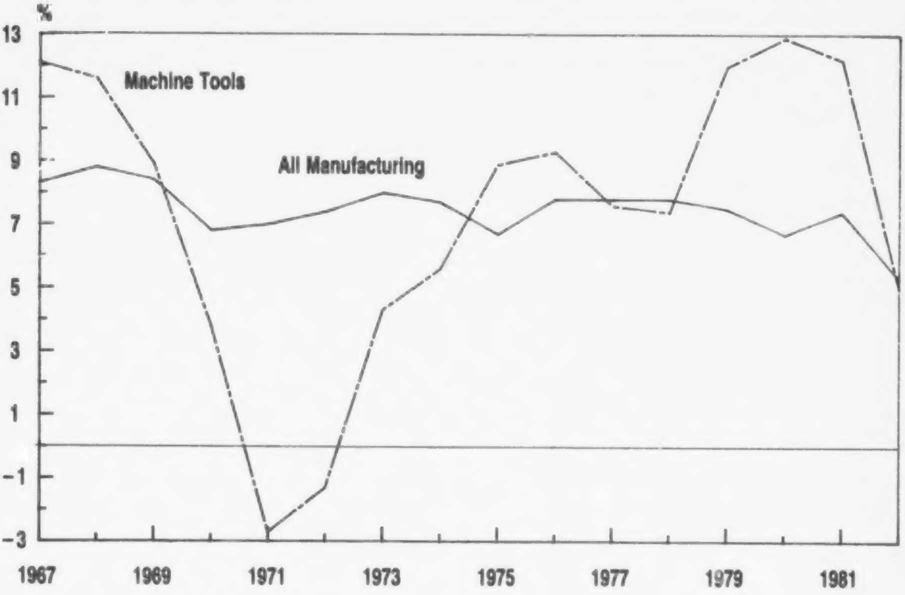
Year	Sales	Operating Profit	Depreciation	Book Value	Working Capital	Capital Expenditures
1956	73.4	66.0	45.8	75.3	67.1	90.7
1957	67.9	53.3	50.9	78.8	71.0	67.2
1958	42.6	14.9	52.4	77.4	70.3	51.4
1959	46.3	15.7	53.8	75.5	68.0	42.5
1960	54.8	26.5	56.6	75.6	65.8	61.1
1961	54.1	29.3	56.1	76.4	67.6	45.3
1962	59.6	28.4	50.9	77.8	70.1	44.9
1963	61.7	37.2	58.0	80.0	72.2	61.9
1964	64.9	57.1	66.0	74.5	66.1	95.1
1965	77.2	70.1	73.6	81.6	82.2	103.2
1966	92.9	88.7	84.4	90.2	92.1	142.5
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	99.0	100.3	117.5	106.9	101.7	167.6
1969	100.7	87.6	118.9	110.2	103.6	156.7
1970	89.7	42.4	120.8	110.1	107.7	122.3
1971	73.4	16.2	112.7	108.0	101.9	93.9
1972	88.4	32.2	111.8	106.2	104.7	150.6
1973	119.4	73.1	116.0	111.8	107.4	217.8
1974	145.0	81.4	124.5	116.5	153.2	247.8
1975	156.6	82.7	136.8	120.5	159.6	176.5
1976	146.9	79.0	142.5	124.8	154.1	156.3
1977	167.2	114.5	151.9	132.5	158.1	208.9
1978	197.7	165.5	157.1	149.2	169.9	248.2
1979	237.5	234.4	177.8	177.8	190.0	371.7
1980	309.2	277.9	218.4	226.8	263.4	542.6
1981	331.1	284.3	258.0	254.7	272.0	489.4

(a) Data in this table represent a composite of financial information for six publicly held machine tool companies. Companies included in the group have changed through time, but not since April 1968.

Source: Standard & Poor's Corporation, Data in original form, 1941-43 equals 10, taken from "Industry Surveys", a copyright of Standard & Poor's Corporation. "Industry Surveys" has a wide variety of additional information for the machine tool composite and individual companies.

Net Income Before Taxes As a Percent of Sales

All Manufacturing and Machine Tools, 1967 to Date



AVERAGE NET INCOME OF ALL MANUFACTURING CORPORATIONS AND MACHINE TOOL COMPANIES SURVEYED

1967 to Date

	NET INCOME BEFORE TAXES			
	As Percent of Sales		As Percent of Assets	
Year	All Manufacturers	Machine Tool Manufacturers (a)	All Manufacturers	Machine Tool Manufacturers (a)
1967	8.3%	12.1%	10.9%	16.6%
1968	8.8	11.6	11.7	15.1
1969	8.4	8.9	10.7	10.6
1970	6.8	3.8	8.3	4.8
1971	7.0	(2.7)	8.7	(2.7)
1972	7.4	(1.3)	9.5	(1.4)
1973	8.0	4.3	11.0	4.8
1974	7.7	5.6	10.7	7.2
1975	6.7	8.9	8.8	12.7
1976	7.8	9.3	10.6	12.3
1977	7.8	7.6	13.5	12.8
1978	7.8	7.4	10.7	11.8
1979	7.5	12.0	11.1	16.9
1980	6.7	12.9	9.5	19.4
1981	7.4	12.2	10.5	18.0
1982	5.3	5.0	6.7	6.1

(a) Data based on the machine tool activities of about 100 companies.

Note: Figures in parentheses represent negative figures.

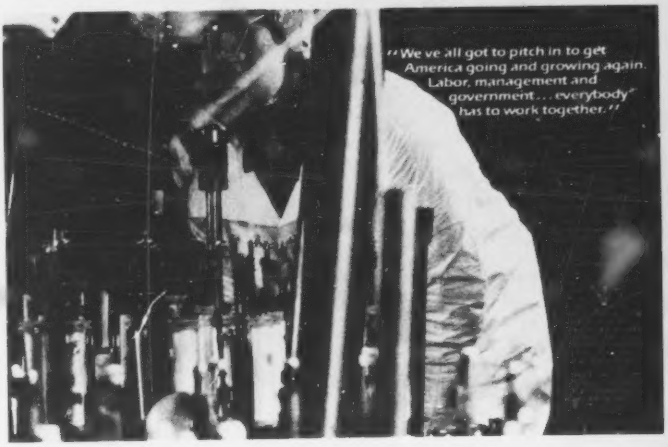
Sources: National Machine Tool Builders' Association, Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

In the battle of the world marketplace, help arm America with the facts.

MADE
IN U.S.A.
getting America going and growing

The United States faces a serious challenge from industrialized nations. To enlist the aid of Americans in meeting that challenge, NMTBA offers a colorful, attractively photographed, 20-page booklet to help spread the "Made In USA" message.

"Made In USA" includes a brief description of the economic factors affecting the fate of U.S. industry—the importance and interrelations of personal savings, capital investment, productivity, corporate profits and employment. We each have to act to get America going and growing.


"We ve all got to pitch in to get
America going and growing again.
Labor, management and
government . . . everybody"
has to work together."

Isn't this a message that should be heard by:

- **Your employees**
- **Your customers**
- **Your customers' employees**
- **Your local civic leaders?**

Contact NMTBA's Publication Order Clerk to obtain sufficient quantities of "Made In USA" for your company's use.

nmtba
national
machine
tool builders'
association

9

MACHINE TOOLS IN USE

American Machinist magazine has been conducting surveys of metalworking equipment in use by American industry for over 50 years—a total of 12 complete Inventories. Through the years the impact of advancing technology, shifting industrial classifications and improved statistical techniques have brought about changes in procedures for compilation and publication of inventory data.

Through 1973, the Inventory was conducted every five years covering all the metalworking industries. The 12th Inventory was conducted over a period of three years with approximately one-third of metalworking surveyed each year from 1976 to 1978. As the 12th Inventory was completed in 1978, all of the data in this chapter is taken from this latest compilation. While the data presented are believed to accurately reflect the machine tools in use in the United States, the user should be aware of two differences between the 12th Inventory and those of earlier years.

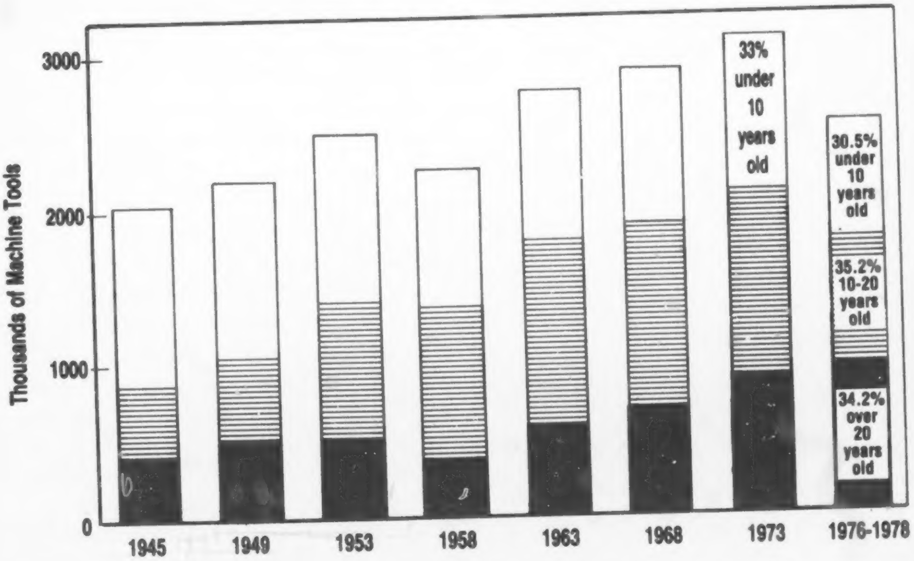
Since the data were collected and published over a three-year period, the inventory taken in one year may not be directly comparable with that of another. Also, earlier inventories included metalworking establishments of all sizes whereas the 12th Inventory emphasized plants with 20 or more employees. American Machinist has prepared estimates of the number of machines in plants with less than 20 employees. The tables in this chapter which include these estimates are so noted.

Also included is the chart of Inventory data showing the number of machine tools in seven industrial nations and their average age distribution. This chart brings to light the fact that while the U.S. has a very large stock of machine tools it is also a relatively old, somewhat obsolescent stock.

The American Machinist Inventory is based on a sample survey. It is in the nature of such a survey that the reliability of the data is greatest in the broader categories. It decreases as survey results are broken down into smaller and smaller cells. A broad breakdown, such as "grinding machine tools in the North Central States," will therefore tend to be more reliable than a very detailed breakdown such as "circular saws, over 20 years old, in New Mexico and Texas."

As this edition of the Economic Handbook goes to press, American Machinist is compiling their 13th Inventory. American Machinist has scheduled the release of the 13th Inventory for the Fall of 1983. Additional information concerning the American Machinist Inventory may be obtained from Manufacturing Research Institute of American Machinist, 1221 Avenue of the Americas, New York, New York 10020.

Machine Tools in Use in Metalworking Industries



Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

TOTAL MACHINE TOOLS IN THE UNITED STATES
Estimated Number, 1978

Use or Location	Total	Metal Cutting	Metal Forming
TOTAL	3,365,700	2,541,500	824,200
Metalworking Industries (a)	2,630,700	1,986,500	644,200
Other Industries	450,000	315,000	135,000
Training	85,000	80,000	5,000
In Storage and Surplus	200,000	160,000	40,000

(a) As used here, metalworking industries are: furniture industry (SIC 25), primary metals industry (SIC 33), fabricated metal products industry (SIC 34), non-electrical machinery industry (SIC 35), electrical machinery industry (SIC 36), transportation equipment industry (SIC 37), precision instruments industry (SIC 38), and miscellaneous manufacturing industry (SIC 39).

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

MACHINE TOOLS IN USE
Metalworking Industries, 1963 to 1976-1978 (a)
(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10-20 Years		Over 20 Years			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
1963									
All Metalworking	2,808.5	1,011.1	36.0	1,215.6	43.3	581.8	20.7	NA	NA
Non-Electrical Machy.	951.9	315.0	33.1	424.0	44.5	212.9	22.4	NA	NA
Metalworking Machy.	210.6	77.9	37.0	90.3	42.9	42.4	20.1	NA	NA
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968									
All Metalworking	2,869.8	1,021.4	35.6	1,176.2	41.0	672.2	23.4	14.2	0.5
Non-Electrical Machy.	912.5	325.3	35.6	350.4	38.4	236.9	26.0	6.8	0.7
Metalworking Machy.	248.7	97.1	39.0	93.9	37.8	57.7	23.2	1.8	0.7
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973									
All Metalworking	3,065.5	1,009.8	32.9	1,185.1	38.7	870.6	28.4	28.6	0.9
Non-Electrical Machy.	1,103.6	379.8	34.4	410.9	37.2	312.9	28.4	15.1	1.4
Metalworking Machy.	274.5	105.5	38.4	102.3	37.3	66.6	24.3	3.3	1.2
Machine Tools	57.1	17.2	20.1	20.0	35.0	19.9	34.9	1.5	2.6
1976-1978 (b)									
All Metalworking	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Non-Electrical Machy.	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machy.	242.1	82.1	33.9	87.8	36.3	72.2	29.8	6.0(c)	3.1(c)
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7

NA - Not Available.

(a) Includes estimates of machines in plants with less than 20 employees.
(b) Machines 20 years old are included in the "Over 20 Years" category.
(c) Metal cutting industries only.

Source: American Machinist Metalworking Equipment Inventories.

MACHINE TOOLS IN USE IN SEVEN INDUSTRIAL NATIONS
By Number and Age
(Number in Thousands)

			Percent of Total		
Country	Year	Total	Under 10 Years	10-20 Years	Over 20 Years
United States	1976 – 78	2,631	31%	35%	34%
West Germany (c)	1977	1,480	37	37	26
United Kingdom	1976	891	39	37	24
Japan	1973	825(a)	61	21	18
France(d)	1974	742	37	33	30
Italy (e)	1975	541(b)	42	30	28
Canada	1978	211	47	35	18

(a) American Machinist, March 1977, indicates this total is for plants with over 100 employees only and the number of plants with less than 100 employees is large. In October 1973 American Machinist estimated the Japanese machine tool park at 1.5 million units.
(b) This total applies only to plants in the metalworking industries with 20 or more employees. The total number of machine tools in plants of all sizes in all industries is estimated to be about 840 thousand.
(c) Machine tool age classifications are as follows: Under 11 Years, 11 to 20 Years, Over 20 Years.
(d) Machine tool age classifications are as follows: Under 9 Years, 9 to 19 Years, Over 19 Years.
(e) Machine tool age classifications are as follows: Under 9 Years, 9-17 Years, Over 17 Years.

Source: McGraw Hill, Inc. "American Machinist" and Verein Deutscher Werkzeugmaschinenfabrik e.V.

MACHINE TOOLS IN USE

Metalworking Industries (a), 1976-1978

(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10-19 Years		20 Years and Over			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
TOTAL	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Metal Furniture, Fixtures	36.8	12.4	33.7	12.7	34.5	11.8	32.1	NA	NA
Primary Metals	117.3	34.2	29.1	38.2	32.6	44.9	38.3	0.8	0.6
Fabricated Metal Products	631.6	172.9	27.4	222.5	35.2	236.3	37.4	5.6	0.9
Fab. Structural Metal Products	162.5	50.5	31.1	64.1	39.4	47.9	29.5	2.0	1.2
Screw Machine Products	94.3	26.7	28.3	33.4	35.4	33.0	35.0	NA	NA
Metal Stampings	113.8	29.7	26.1	38.2	33.6	45.9	40.3	0.4	0.3
Other Fab. Metal Products	261.0	66.1	25.3	86.2	33.0	109.5	42.0	NA	NA
Non-Electrical Machinery	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machinery	242.1	82.1	33.9	87.8	36.3	72.2	29.8	NA	NA
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7
Special Industry Machy.	97.6	27.3	28.0	33.5	34.3	36.8	37.7	4.2	4.3
General Industrial Machy.	133.5	50.7	38.0	52.1	39.0	44.1	33.0	3.1	2.3
Other Non-Elec. Machy.	487.8	154.6	31.7	164.2	33.7	155.6	31.9	NA	NA
Electrical Machinery	339.1	111.9	33.0	141.3	41.7	85.9	25.3	4.7	1.4
Elec. Industrial Apparatus	67.3	20.9	32.8	24.8	38.9	18.0	28.3	1.2	1.9
Communications Equip.	62.8	18.3	29.1	34.2	54.5	10.4	16.6	1.4	2.2
Other Elec. Machy.	212.6	72.7	34.2	82.3	38.7	57.5	27.0	2.1	1.0
Transportation Equip.	361.1	86.0	23.8	119.2	33.0	155.9	43.2	9.1	2.5
Motor Vehicles, Equip.	177.9	42.3	23.8	55.9	31.4	79.7	44.8	1.0	0.6
Aircraft and Parts	139.1	32.6	23.4	94.2	67.7	57.9	41.6	7.4	5.3
Others Trans. Equip.	44.1	11.1	25.2	14.7	33.3	18.3	41.5	0.7	1.6
Precision Instruments	132.5	50.4	38.0	48.8	36.8	33.3	25.1	2.5	1.9
Misc. Mfg. Industries	51.3	19.8	38.6	17.2	33.5	14.4	28.1	0.4	0.8

NA - Not Available.

Note: Individual items may not add to totals due to rounding.

(a) Includes estimates of machines in plants with less than 20 employees.

Source: American Machinist, "The 12th American Machinist Inventory of Metalworking Equipment, 1976-1978."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

By Major User Industry, 1973

(Number in Thousands)

	Total Machine Tools		Metal Cutting Machines		Metal Forming Machines	
Using Industry	Number	%	Number	% Under 10 Yrs. Old	Number	% Under 10 Yrs. Old
TOTAL	3,065.5	100.0%	2,362.2	34%	703.3	31%
Ordnance & Accessories	42.7	1.4%	35.2	28%	7.5	28%
Furniture & Fixtures	43.7	1.4	18.2	32	25.4	29
Primary Metals Industries	162.9	5.3	129.7	26	33.2	27
Fabricated Metal Products	638.4	20.8	394.0	33	244.4	28
Non-Electrical Machinery	1,103.6	36.0	968.3	35	135.3	30
Electrical Machy. & Equipment	398.7	13.0	280.2	40	118.5	38
Transportation Equipment	400.9	13.1	328.1	30	72.8	32
Precision Instruments	164.3	5.4	140.7	29	23.5	35
Miscellaneous Mfg. Industries	110.4	3.6	67.8	33	42.6	23

Source: American Machinist, "11th Inventory of Metalworking Equipment, 1973."

GEOGRAPHICAL DISTRIBUTION OF MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES, 1976-1978 (a)

(By Number and Age Distribution)

	Metal Cutting Machines					Metal Forming Machines					No. Units with NC		% Plants with NC			
Region and Area	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Cutting	Forming	Cutting	Turning	Mach. ctrs.	Forming
U.S.A.	1,736,282	10%	21%	35%	34%	581,441	9%	20%	36%	35%	40,019	2,003	24%	12%	16%	4%
NORTHEAST																
Boston	103,678	10%	22%	35%	33%	32,416	9%	21%	37%	33%	2,529	117	29%	13%	20%	4%
Bridgeport-Hartford	74,812	9	18	35	38	23,420	9	20	36	35	1,909	46	25	10	15	2
New York-Newark	126,112	11	23	37	29	44,627	10	21	38	31	2,657	174	20	8	13	2
Buffalo-Syracuse	64,642	11	21	34	34	18,896	10	19	36	35	1,410	72	30	14	24	5
Philadelphia-Camden	85,897	10	21	35	34	32,918	9	20	38	33	1,799	102	22	9	15	3
Pittsburgh-Wheeling	53,970	9	21	35	35	20,198	9	21	35	35	1,141	84	28	17	16	3
SOUTHEAST																
Baltimore	16,442	9	21	38	32	5,491	8	19	42	31	359	21	28	8	19	7
Richmond	46,587	9	21	36	34	17,388	8	21	37	34	899	58	28	12	22	5
Atlanta-New Orleans	83,183	10	21	36	33	35,206	9	20	37	34	1,734	117	16	7	11	4
MIDWEST																
Cleveland	84,332	10	21	35	34	31,293	9	18	36	37	1,776	85	26	15	17	5
Toledo	22,748	10	19	36	35	8,042	9	17	36	38	369	14	30	15	23	5
Cincinnati-Louisville	70,917	9	20	36	35	23,477	9	18	36	37	1,668	61	27	16	20	3
Detroit	118,601	10	20	33	37	35,919	9	17	33	41	1,740	56	25	9	15	2
Indianapolis	70,239	10	18	32	40	18,903	9	18	35	38	1,287	45	23	10	13	2
Chicago	245,090	12	21	35	32	89,470	10	20	36	34	5,546	373	22	12	14	5
Milwaukee	63,831	11	20	33	36	20,092	10	19	35	36	1,426	76	25	12	17	5
Minneapolis-St. Paul	33,240	10	22	35	33	10,151	10	19	35	36	820	42	27	10	17	5
St. Louis	62,530	10	20	36	34	21,276	9	19	37	35	1,591	72	11	8	7	4
SOUTHWEST																
Kansas City - Tulsa	36,287	10	19	35	36	11,243	9	18	37	36	1,029	45	24	13	18	5
Dallas-Houston	57,722	11	20	35	34	16,870	9	19	36	36	1,835	71	26	17	17	4
MOUNTAIN AND PACIFIC																
Denver	25,573	11	21	36	32	8,276	9	19	39	33	564	28	24	13	18	5
Seattle-Portland	21,061	9	20	35	36	6,002	7	17	35	41	633	22	22	10	14	4
San Francisco	29,778	10	23	39	28	10,350	8	21	38	33	626	48	20	9	14	6
Los Angeles	141,010	11	23	37	29	39,517	9	21	38	32	4,672	174	26	12	4	2

(a) Includes only plants with 20 or more employees.

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES (a)
By Major Type and Age, 1976-1978

Type of Machine Tool	Plants With	Total Units	Change Since '73	Percent of Total	0-4 Years	5-9 Years	10-19 Years	20 Years and Over
GRAND TOTAL	—		−14%	100.0%	10%	21%	35%	34%
Turning Machines	84%	423,900	−14	16.1	9	18	34	39
Grinding Machines	82	402,900	−18	15.3	10	21	35	34
Drilling Machines	87	373,100	−18	14.2	9	20	37	33
Mechanical Presses	45	251,300	−14	9.6	6	15	36	43
Milling Machines	78	251,200	−13	9.5	10	22	37	31
Cutoff and Sawing	86	169,900	−22	6.4	13	25	38	23
Bending and Forming	45	83,700	−15	3.2	10	22	38	30
Polishing and Buffing	40	74,600	−32	2.8	9	25	37	29
Punching and Shearing	43	65,800	−26	2.5	11	22	35	33
Hydraulic, Pneumatic Presses	36	64,300	−16	2.4	14	25	36	25
Boring Machines	32	54,100	−26	2.1	8	16	34	45
Coil Handling	16	53,400	—	2.0	13	28	40	19
Riveting Machines	21	46,400	−16	1.8	12	26	40	22
Gear-Cutting Machines	11	42,100	+2	1.6	7	11	34	48
Tapping Machines	26	31,100	−14	1.2	14	25	35	26
Forging Machines	8	22,700	−18	0.9	8	14	30	48
Shaping Machines	31	22,200	−22	0.8	2	5	28	65
Honing Machines	26	21,000	+1	0.8	13	26	36	25
Multi-Function Machines	17	20,200	+37	0.8	38	39	21	2
Automatic Assembly	7	19,300	+12	0.7	24	33	31	11
Spcl. Way-Type & Transfer	5	18,700	+26	0.7	21	27	33	19
Broaching Machines	18	14,500	−1	0.6	8	10	33	43
Threading Machines	16	13,200	−16	0.5	10	15	36	40
Electrical Machining	15	12,000	+7	0.5	26	35	33	6
Lapping Machines	11	10,000	−20	0.4	12	28	30	30
Planing Machines	11	6,700	−12	0.3	2	5	22	71

(a) Includes estimates of machines in plants with less than 20 employees.

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

NUMERICALLY CONTROLLED MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES (a)

Number by Type of Machine and User Industry, 1976-1978

	Metal Cutting						Metal Forming Total
Using Industry	Total	Turn	Bore	Drill	Mill	Multi-Function	
TOTAL	40,019	9,378	2,894	3,216	4,498	18,328	2,003
Metal Furniture and Fixtures	Z	Z	Z	Z	Z	Z	81
Primary Metals Industries	680	209	73	23	89	260	11
Fabricated Metal Products	4,086	1,098	370	304	343	1,767	590
Ordnance and Accessories	702	164	71	14	26	408	14
Non-Electrical Machinery	20,348	5,308	1,601	1,734	1,046	10,263	491
Metalworking Machinery	4,830	889	556	319	282	2,590	13
Special Industry Machinery	2,634	471	218	338	160	1,445	35
Electrical Machinery and Equipment	4,229	744	137	571	408	2,055	420
Transportation Equipment	8,023	1,588	676	487	2,342	2,702	158
Aircraft Engines and Parts	6,695	1,237	557	351	2,207	2,207	60
Precision Instruments	2,070	397	33	92	228	1,218	244
Miscellaneous Manufacturing Industries	189	34	Z	Z	41	57	Z

(a) Includes only plants with 20 or more employees.

Z - Less than 10 units.

Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

1984 INTERNATIONAL MACHINE TOOL SHOW

September 5-13, 1984 • Chicago, Illinois USA

McCORMICK PLACE WEST
McCORMICK PLACE EAST
O'HARE EXPO CENTER
imts 84

A World Of Productive Ideas.

If you are looking for solutions to tomorrow's metalworking challenges, don't miss IMTS-84. More than 1000 companies from 30 nations will display their products.

IMTS-84 will cover 1-1/2 million square feet (150,000 square meters) with the most up to date manufacturing technology.

There will be hundreds of new ideas for:

- **Managers who want to cut costs.**
- **Engineers who want to improve quality.**
- **Maintenance people who want fewer production delays.**
- **Production supervisors who want to improve productivity.**
- **Planners who are looking for better ways to manufacture.**
- **Everyone else who wants to find better production equipment, ideas and services.**

A visit to IMTS is so productive that 96% of previous visitors found useful new ideas that they put to work in their plants right away.

Don't miss America's biggest and best industrial exposition. Your competitors will be there — you should attend too.

nmtba
national
machine
tool builders'
association

For further information contact:
IMTS-84
NATIONAL MACHINE
TOOL BUILDERS' ASSOCIATION
7901 Westpark Drive
McLean, Virginia 22102, USA
TWX: 710-831-0031
CABLE: INMATOOL
TELEPHONE: 703-893-2900

Abbreviations

and

Explanation of Terms

ABBREVIATIONS

ADR — The Asset Depreciation Range System

BEA — Bureau of Economic Analysis

BLS — Bureau of Labor Statistics

BTN — Brussels Tariff Nomenclature

CCC — Customs Co-Operation Council

CECIMO — Comité Européen de Coopération des Industries de la Machine Outil

C.I.F. — Cost, Insurance and Freight. Under these terms, the seller quotes a price which includes the cost of the goods, marine insurance and the transportation charges to a specified point of destination.

D — Withheld to avoid disclosing figures for individual companies

E — Estimate

EEC — European Economic Community

F.A.S. — Free Alongside Ship. Prices specified under these export terms provide that the seller delivers the goods to be exported alongside the overseas vessel within reach of its loading equipment.

F.O.B. — Free on Board. Seller is required to place goods aboard the equipment of the transporting carrier without cost to the buyer. The term F.O.B. must be qualified by a name destination.

FTC — Federal Trade Commission

GNP — Gross National Product

ILO — International Labor Organization

ITC — International Trade Commission

NA — Not Available

NC — Numerically Controlled

NEC — Not Elsewhere Classified

NMTBA — National Machine Tool Builders' Association

P — Preliminary

R — Revised

S — Estimate did not meet Publication Standards

SEC — Securities and Exchange Commission

S.I.C. — Standard Industrial Classification

SITC — Standard International Trade Classification of the United Nations

TSUSA — Tariff Schedules of the U.S., Annotated

U.N. — United Nations

VDMA — Verein Deutscher Maschinenbauanstalten

VDW — Fachgemeinschaft Werkzeugmaschinen in VDMA

Z — Figure below the Minimum Unit of Measure Selected

EXPLANATION OF TERMS

ACCESSIONS
........See LABOR TURNOVER

AIRCRAFT, MISSILES AND PARTS
........Industry Group, conforming to the Standard Industrial Classification. Consists of Industry Group, SIC 372, Aircraft and Parts, and SIC 376, Establishments Primarily Engaged in Manufacturing Complete Guided Missiles and Space Vehicles and Parts.

ASSETS, NET
........Total net assets are the sum of all recorded assets after reducing such amount by allowance or reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

AVERAGE HOURLY EARNINGS
........See EARNINGS

AVERAGE STRAIGHT-TIME HOURLY EARNINGS
........See EARNINGS

AVERAGE WEEKLY HOURS
........See HOURS, AVERAGE WEEKLY

AVERAGE WEEKLY EARNINGS
........See EARNINGS

BACKLOG
........See ORDERS, UNFILLED

CANCELLATIONS
........Gross new orders less cancellations equal net new orders in the order data of NMTBA. Cancellation provisions are usually specified in purchase orders.

CAPACITY UTILIZATION
........There are seven different series on capacity utilization. The most widely used are the indexes published by the Federal Reserve Board, the U.S. Department of Commerce's Bureau of Economic Analysis and McGraw-Hill Publications. Though their statistical methodology varies, each of these indexes attempts to present a measure of current physical industrial output levels as they compare to the potential level of output if all available productive facilities were in full use. Some series measure utilization according to absolute output potential while others measure utilization relative to that portion of absolute capacity which management prefers. While these differences lead to divergent index numbers, quite often the relative changes of the different indexes parallel each other.

CAPITAL EXPENDITURES
........See PLANT AND EQUIPMENT

CAPITAL GOOD INDUSTRIES
........This category is defined as the Nonelectrical Machinery industry, exclusive of farm machinery and equipment producers and machinery shops, the Electrical Machinery Industry, exclusive of household appliances and electronic components manufacturers, and the non-defense portion of the following industries: Shipbuilding and Repairing, Railroad Equipment, Communication Equipment, Aircraft and Parts, and Ordnance plus Defense Products.

COMPENSATION
........See EARNINGS; PAYROLL

COMPENSATION, SUPPLEMENTARY
........Supplementary compensation statistics fall into two broad categories and are intended to capture

payroll expenditures made by employers which are in addition to the stated hourly wage rate. These categories are:

1. Payments to Workers—which includes payments for paid leave time, premiums for overtime, weekend, holiday, and shift work; non-production bonuses (e.g., Christmas); and terminal payments.
2. Expenditures in Addition to Payroll—which encompass expenditures for which the employer irrevocably makes a payment under the provisions of a legally required insurance program or private welfare plan; e.g., social security, unemployment compensation and other insurance for the benefit of the workers; life, accident, and health insurance; pension and retirement plans; vacation and holiday funds; severance and supplemental unemployment benefit plans; and savings and thrift plans.

For further explanation, see the "BLS Handbook of Methods, U.S. Bureau of Labor Statistics, Bulletin 1910."

CONSTANT DOLLARS

........Constant dollar estimates represent an effort to remove the effects of price changes from statistical series. In general, they are arrived at by dividing current dollar estimates by appropriate price indexes.

Any changes in such a series would reflect only changes in the "real" (physical) volume of output.

........See IMPLICIT PRICE DEFLATOR.

CONSUMER PRICE INDEX

........See PRICE INDEX

CONSUMPTION

........The term consumption, as used in this publication, refers to the domestic production, less exports, plus imports of a particular commodity.

CONTROLS

........See NUMERICAL CONTROLS

CORPORATE CAPITAL CONSUMPTION ALLOWANCES

........Accounting charges which reflect estimates of wear and tear, obsolescence, destruction, and accidental losses of physical capital.

Gross National Product less capital consumption allowances is referred to as Net National Product.

COST OF MATERIALS

........See MATERIALS, COST OF

DEFENSE PRODUCTS

........The "defense products" category for manufacturers' shipments, orders, and inventories consists of communication equipment, complete aircraft and parts, shipbuilding and military tank vehicles and ordnance. See Census Bureau, Current Industrial Report, Series: M3-1 and MA-175 Shipments of Defense-oriented Industries.

DEPRECIATION

........Depreciation is the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous depreciation methods, all based on a periodic charge to an expense account and a corresponding credit to a depreciation reserve.

Plant (Structure and Additions) depreciation and amortization are usually reported separately from machinery and equipment depreciation.

DIFFERENTIAL (SHIFT)

........Shift differentials represent premium payments for work on late or night shifts. They are part of Supplementary Compensation (See COMPENSATION, SUPPLEMENTARY) paid to workers.

DOMESTIC (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........Totals are the sum of "domestic" and "foreign." "Domestic" represents business activity originating within or destined for the United States, its territories and possessions.

DURABLE GOODS

........An item, destined for either producers or consumers, that in normal use is likely to last longer than three years. Consumer durable goods include automobiles, appliances, jewelry and books. Producer durable goods include a wide range of machinery and equipment.

DURABLE GOODS INDUSTRIES

........Comprise manufacturing major industry groups with SIC Codes 19, 24, 25, and 32 through 39. All other manufacturing major industry groups in SIC Codes 20 through 39 are considered as nondurable goods manufacturing industry groups.

EARNINGS

........Earnings are the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

........AVERAGE HOURLY EARNINGS

........are on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid on an incentive plan.

........AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........exclude premium payments for overtime and for work on weekends, holidays, and late shifts. Regular day-shift wages or salaries paid per hour worked during a standard workweek are included; incentive pay, production bonuses, and cost of living payments are included in these statistics. Non-production bonuses are excluded.

........AVERAGE WEEKLY EARNINGS

........are derived by multiplying average weekly hours by hourly earnings.

ELECTRICAL MACHINERY INDUSTRY

........Major Group 36, Electrical Machinery, Equipment and Supplies, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........361. Electrical Transmission and Distribution Equipment
362. Electrical Industrial Apparatus
363. Household Appliances
364. Electrical Lighting and Wiring Equipment
365. Radio and Television Receiving Sets
366. Communication Equipment
367. Electronic Components and Accessories
369. Miscellaneous Electrical Machinery, Equipment and Supplies

EQUITY

........See STOCKHOLDER'S EQUITY

ESTABLISHMENT

........The "establishment" is the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity, it is required to submit separate reports, provided that plant records permit such a separation and the activities are substantial in size.

EXCHANGE RATES

........An exchange rate is nothing more than the purchase price of a unit of one nation's currency expressed in terms of another nation's currency. The exchange rates cited in this text are the market rates published by the International Monetary Fund.

EXPENDITURES ON NEW PLANT AND EQUIPMENT

........See PLANT AND EQUIPMENT

EXPORTS

........EXPORTS OF DOMESTIC MERCHANDISE—TOTAL

........Data are compiled from copies of Shippers' Export Declarations filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Values of containers and coverings are included. Freight, insurance and other charges to the point of export are included, but freight and other charges from the place of departure in the United States to the destination in the foreign country are not.

A description of the procedures used for compiling these statistics appears in Report FT 410, United States Exports, Commodity by Country, published by the U.S. Bureau of the Census.

MANUFACTURERS' EXPORT SHIPMENTS

........These data are based on manufacturers' factory shipments for exports. For machine tools the value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines. Rebuilt machinery, machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking are excluded.

FROM FOREIGN COUNTRIES

........Export statistics supplied by the United Nations and foreign countries are defined by the originating agency and may not be comparable to U.S. definitions.

........The International Trade Statistics Center, Statistical Office of the United Nations prepares some special data on the U.S. share of exports from fourteen supplier countries to the world and to 90 countries of destination. The definition of machine tools for this series is the Standard International Trade Classification, Revised (SITC) of the United Nations, SITC NO. 715.1, Machine Tools for Working Metals. (See MARKET SHARE).

Exports are value F.O.B. port of shipment by all reporting countries, except Canada which values exports F.O.B. inland point of shipment and the United States which values exports F.A.S.

U.S. and U.K. data refer to exports of domestic merchandise; data for Denmark, Japan, Norway and Sweden are for exports including re-exports; Canadian data are for general exports.

The table on "Machine Tool Exports from 14 Supplier Countries to the U.S." appearing in this text is based on the U.N. figures.

The special tables on German, British, Italian and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

The definition of "Exports of Domestic Merchandise—Total" is broader than the definition of "Manufacturers' Export Shipments." Exports in the first category should, therefore, be larger than those in the second category. While this generally is the case, it is not always the case. In certain classifications, manufacturers' export shipments in some years exceed total exports of domestic merchandise. The reasons for this may lie in differences in the time of reporting, difference in classifying certain machine tools, and, possibly, in errors of classification on Shippers Export Declarations.

Differences will also be noted between U.S. exports to a foreign country and the imports from the U.S. reported by that country for the same year. The reverse also occurs—U.S. imports from a given country may differ from the exports to the U.S. reported for the same year by that country.

This may be due to differences in the time the exports and imports were reported, differences in determining values, differences in the classification of commodities, differences in conversion of currencies, and errors in classification or computation.

FABRICATED METAL PRODUCTS INDUSTRY

........The Production Indexes published in this book appear as compiled by the Board of Governors of the Federal Reserve System.

........See INDUSTRIAL PRODUCTION

........in all other tables consists of SIC Major Group 34, Fabricated Metal Products except Machinery and Transportation Equipment. The SIC Industry Groups included are:

........341. Metal Cans
342. Cutlery, Hand Tools, and General Hardware
343. Heating Equipment (except electrical) and Plumbing Fixtures
344. Fabricated Structural Metal Products
345. Screw Machine Products, and Bolts, Nuts, Screws, Rivets and Washers
346. Metal Stampings
347. Coating, Engraving and Allied Services
348. Ordnance and Accessories
349. Miscellaneous Fabricated Metal Products.

FOREIGN (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........"Totals" are the sum of "domestic" and "foreign." "Foreign" represents all business activity destined for other than the United States, its territories or possessions.

FOREIGN INVESTMENT, DIRECT U.S.

........Direct U.S. foreign investment consists of net capital outflows from the U.S. into businesses in which U.S. residents have significant control. Reinvested returns of the foreign investment are included in these data but portfolio holdings of foreign securities are excluded.

FOREIGN TRADE

........See EXPORTS; IMPORTS

FRINGE BENEFITS

........See COMPENSATION, SUPPLEMENTARY

FURNITURE AND FIXTURE INDUSTRY

........Major Group 25, Furniture and Fixtures, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........251. Household Furniture
252. Office Furniture
253. Public Buildings and Related Furniture
254. Partitions, Shelving, Lockers, and Office and Store Fixtures
259. Miscellaneous Furniture and Fixtures.

GNP—GROSS NATIONAL PRODUCT

........Gross National Product or expenditure is the market value of the output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods.

Gross national product comprises the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

GROSS NEW ORDERS

........SEE ORDERS

GROSS PRIVATE DOMESTIC INVESTMENT

........Consists of fixed investment and change in business inventories. Fixed investment measures additions to, and replacements of, private capital brought about through net acquisitions by businesses and non-profit institutions of durable equipment and structures for business and residential purposes.

HEALTH, INSURANCE AND RETIREMENT PLANS

........See COMPENSATION, SUPPLEMENTARY

HOLIDAYS, PAID

........See COMPENSATION, SUPPLEMENTARY

HOURS, AVERAGE WEEKLY

........These statistics are derived by dividing the total of all hours worked in a reporting establishment or industry, including overtime, by the number of employees who received remuneration for their work. Such data differs from standard or scheduled hours.

HOURS, OVERTIME

........Overtime hours represent that portion of the gross average weekly hours which were in excess of regular hours and for which premium payments were made.

Overtime hours are premium hours by definition.

HOURS, SCHEDULED, WEEKLY

........Refers to the predominant work schedule for full-time production workers employed on the day shift.

IMPLICIT PRICE DEFLATOR

........The implicit price deflator is the price index for gross national product. It is a weighted average of the price indexes used to deflate the components of GNP. The implicit weights used are expenditures in the current period. The implicit price index is generally regarded as the best single measure of broad price movement in the economy as a whole.

IMPORTS

........Imports are classified as "general imports" or "imports for consumption." In this volume, we generally speak of "imports for consumption." These are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption.

IMPORTS INTO THE UNITED STATES

........Data are compiled from Import Entries filed with U.S. Customs officials. Import values are in general based on the market value or price in the foreign country at the time of exportation of such merchandise. These values include the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed ready for shipment to the United States, but exclude import duties, insurance, ocean freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of exchange prevailing on the day the merchandise is shipped to the United States (but the same rate of exchange may be used for each currency for a 3-month period so long as the rate on any particular day did not vary from it by 5 percent or more).

........Machine tool import data includes used and rebuilt machine tools, replacement parts and home workshop tools. Also included may be some metalworking machinery other than machine tools.

Because the SIC and the statistical export and import classifications were developed independently, there are considerable difficulties in meshing the three systems. Many adjustments are required for comparability. The Census Bureau has published several imports in which comparability is attempted. Among these are annual volumes on U.S. Commodity Exports as Related to Output, U.S. Imports for Consumption and General Imports, SIC-Based Product Classification, by Area, FT 210, and U.S. Exports of Domestic Merchandise, SIC-Based Products and Area, FT 610.

A description of the procedures for compiling import statistics appears in Report FT 135, U. S. Imports, General and Consumption, Schedule A, Commodity and Country, published by the U.S. Bureau of the Census.

IMPORTS INTO FOREIGN COUNTRIES

........The separate tables on German, British, Italian, and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

Differences will be noted between U.S. imports from a foreign country and the exports to the U.S. from that country for the same year. The reverse also occurs—U.S. exports to a given country may differ from the imports from the U.S. reported by that country for the same year. These differences may be due to differences in the time the imports and exports were reported, differences in determining values, differences in classification of commodities, differences in the conversion of currencies, and errors in classification or computation.

INCOME

........NET OPERATING INCOME.

........is total net sales less total operating costs.

NET INCOME (Before Income Taxes).

........is Net Operating Income plus or minus "Other Income and Expense."

OTHER INCOME AND EXPENSE.

........includes interest, income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

NET INCOME (After Income Taxes).

........equals Net Income (Before Income Taxes) less all income taxes.

INDUSTRIAL PRODUCTION, TOTAL

........A measure of the physical output of U.S. manufacturing, mining, and utility industries compiled monthly by the Board of Governors of the Federal Reserve System. Covering about 35% of the total U.S. output of goods and services, the index includes a representative group of products, ranging from pig iron and cotton yarn to machine tools and electricity. It excludes agriculture, construction, and service industries. The relative importance assigned to individual products is based on quantity and value data determined from recent government censuses. Manufacturing accounts for 88.55% of the index, mineral production for 6.37%, and utilities for 5.08%. Current output is expressed as a percentage of annual production levels during 1967.

INSTRUMENTS AND RELATED PRODUCTS

........Major Group 38. Measuring, Analyzing and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks, according to the Standard Industrial Classification, comprises SIC Industry Groups.

........381. Engineering, Laboratory, Scientific and Research Instruments and Associated Equipment
382. Measuring and Controlling Instruments
383. Optical Instruments and Lenses
384. Surgical, Medical, and Dental Instruments and Supplies
385. Ophthalmic Goods
386. Photographic Equipment and Supplies
387. Watches, Clocks, Clockwork Operated Devices, and Parts

INVENTORIES

........End of month stocks of manufacturing establishments regardless of stage of fabrication. These inventories are valued at cost in the economic and statistical indicators, but are valued at current prices in the National Income and Product Accounts (which measure change in business inventories).

LABOR TURNOVER

........Labor turnover is the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Data for each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, whether full- or part-time, permanent or temporary, including executive, office, sales, other salaried personnel and production workers.

ACCESSIONS

........are the total number of permanent and temporary additions to the employment roll including both new and rehired employees.

NEW HIRES

........are temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

OTHER ACCESSIONS

........which are not published separately but are included in total accessions, are all additions to the employment roll which are not classified as new hires.

SEPARATIONS

........are terminations of employment during the calendar month and are classified according to cause, quits, layoffs, and other separations, as defined below.

........QUITS

....are terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

LAYOFFS

....are suspensions without pay lasting or expected to last more than 7 consecutive calendar days, initiated by the employer without prejudice to the worker.

OTHER SEPARATIONS

....are terminations of employment because of discharge, permanent disability, death, retirement, etc.

LAYOFFS

........See LABOR TURNOVER.

LEADING INDICATORS

........A set of economic time series, each of which usually reaches business cycle peaks and troughs ahead of general economic activity. While there are forty distinctly recognized leading indicators, only 12 are included in the widely publicized "Composite Index of Leading Indicators".

MACHINE TOOL INDUSTRY

........The machine tool industry covers establishments primarily engaged in producing metal cutting type machine tools and metal forming type machine tools. The U.S. Bureau of the Census has assigned industry SIC codes 3541 and 3542 to these industries.

An establishment is primarily engaged in the machine tool industry if the value of machine tools produced exceeds in value the production of products of other industries.

Because many establishments classified as being within the machine tool industry produce not only machine tools (their "primary products") but also other products (their "secondary products"), the "machine tool industry" figures do not measure machine tool activities only. In 1972, for instance, only 86 per cent of the value of shipments of the "metal cutting machine tool industry" consisted of metal cutting machine tools. The most important other products shipped were machine tool accessories and measuring devices.

While not all the shipments of the machine tool industry were made up of machine tools, some other industries did produce machine tools as their "secondary products." The 1972 Census of Manufactures showed that 90 per cent of all metal cutting machine tools were produced by the "metal cutting machine tool industry." The remaining 10 per cent were shipped by other industries. The "machine tool industry" statistics are important because they permit a measurement of the economic status of the plants which make machine tools their major business—their location, employment, payroll, etc. They are less reliable if we want to measure total machine tool production and shipments. To get the facts on total machine tool production, we should look at "Shipments"—see separate entry.

MACHINE TOOL PRODUCTS
........See SHIPMENTS

MACHINE TOOL SHIPMENTS
........See SHIPMENTS

MACHINE TOOLS, COMPLETE
........Machine tools (See MACHINE TOOLS, DEFINITION) as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines.

MACHINE TOOLS, DEFINITION
........Machine tools are either metal cutting machines or metal forming machines.

METAL CUTTING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques. Machine tools of the metal cutting type are classified under SIC product codes, the first four digits of which are 3541.

METAL FORMING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator while in use, for pressing, forging, hammering, extruding, shearing, bending or die casting metal into shape. Machine tools of the metal forming type are classified under SIC product codes, the first four digits of which are 3542.

MACHINERY, EXCEPT ELECTRICAL
........See NONELECTRICAL MACHINERY

MACHINERY AND EQUIPMENT INDUSTRIES
........are classified as a supplementary market category for manufacturers' orders, inventories and shipments. The other categories are "consumer durables" and "defense products." (See separate item—DEFENSE.)

........MACHINERY AND EQUIPMENT INDUSTRIES CATEGORY, consists of,
....nonelectrical machinery
....See NONELECTRICAL MACHINERY, but excluding farm machinery and machine shops; electrical machinery
....See ELECTRICAL MACHINERY, but excluding household appliances, communication equipment and electronic components; shipbuilding and repairing; and railroad and streetcar equipment.

MAJOR USERS—MAJOR USER CATEGORIES
........The major users of machine tools are the nonelectrical machinery industry, the fabricated metal products industry, the electrical machinery and equipment industry and other industry groups (see individual industry groups) listed in the inventory section of this volume.

MAN-HOURS
........All plant man-hours of production and related workers. Represents all man-hours worked or paid

for including actual overtime hours. Excludes hours paid for vacation, holidays or sick leave when the employee was not at the plant.

MANUFACTURERS' EXPORT SHIPMENTS
........See EXPORTS

MANUFACTURERS' NEW ORDERS
........See ORDERS

MANUFACTURERS' SHIPMENTS
........See SHIPMENTS

MARKET CATEGORY
........Major User Categories are classified either by Industry Group or by Market Category.
........See MAJOR USERS, DEFENSE, and MACHINERY AND EOUIPMENT INDUSTRIES

MARKET SHARE:
........Market Share defines what portion of a country's total imports of a specific commodity are attributable to a specific country of origin. The table in Chapter 6 of this text details this data for machine tool exports from the major Western industrial nations.

MATERIALS, COST OF
........"Cost" is defined as the direct charges actually paid or payable for items consumed or put into production during one year, after discounts, and including freight charges and other direct charges incurred by the establishment in acquiring the materials.

........Cost of materials includes:
- ....the total delivered cost of all raw materials, semi-finished goods, parts, components, containers, scrap, and supplies consumed or put into production during the year:
- ....the amount paid for electric energy purchased;
- ....the amount paid for all fuels consumed for heat, power, or the generation of electricity;
- ....the cost of work done by others on materials or parts furnished by manufacturing establishments (contract work);
- ....the cost of products bought and resold in the same condition.
  - ....cost of materials excludes the cost of services used, such as,
  - ....advertising, insurance, telephone, etc.;
- ....research development, and consulting services;
- ....overhead costs, such as depreciation charges, rent, interest, royalties, etc.;
- ....expense items chargeable to fixed asset accounts.

METAL FORMING
........See MACHINE TOOLS

METAL CUTTING
........See MACHINE TOOLS

METALWORKING INDUSTRY
........Industry Group 354, Metalworking Machinery and Equipment according to the Standard Industrial Classification. This industry group comprises the following industries,
........3541. Machine Tools, Metal Cutting Types
3542. Machine Tools, Metal Forming Types
3544. Special Dies and Tools, Die Sets, Jigs and Fixtures
3545. Machine Tool Accessories and Measuring Devices
3546. Power Driven Hand Tools
3547. Rolling Mill Machinery and Equipment
3549. Metalworking Machinery, N.E.C.

MOTOR VEHICLES AND PARTS INDUSTRY
........Industry Group 371. Motor Vehicles and Motor Vehicle Equipment, according to the Standard Industrial Classification, comprises the following industries.
3711. Motor Vehicles
3712. Passenger Car Bodies
3713. Truck and Bus Bodies
3714. Motor Vehicle Parts and Accessories
3715. Truck Trailers (Full)

NC
........See NUMERICAL CONTROLS

NET ASSETS
........See ASSETS, NET

NET INCOME
........See INCOME

NET NEW ORDERS
........See ORDERS

NET OPERATING PROFIT
........See INCOME

NET PROFIT ON SALES
........See INCOME

NET SALES
........See SALES

NEW HIRES
........See LABOR TURNOVER

NONELECTRICAL MACHINERY INDUSTRY
........Major Group 35, Machinery, except Electrical, according to the Standard Industrial Classification, comprises,

........351. Engines and Turbines
352. Farm Machinery and Equipment
353. Construction, Mining, and Materials Handling Machinery and Equipment
354. Metalworking Machinery and Equipment
355. Special Industry Machinery, Except Metalworking Machinery
356. General Industrial Machinery and Equipment
357. Office, Computing, and Accounting Machines
358. Refrigeration and Service Industry Machinery
359. Miscellaneous Machinery, Except Electrical

NUMERICAL CONTROLS
........Machine tool control systems which operate a machine by means of numerically coded programs inserted or fed into the systems on tape, punched cards, dials, plugs, preset switches or by playback of prerecorded operating programs.

OPERATING PROFIT
........See INCOME, NET OPERATING

ORDERS
........CENSUS SERIES ON SHIPMENTS, INVENTORIES AND ORDERS

........NEW ORDERS, NET,

....represent gross new orders net of cancellations received during the period. The series of new orders is adjusted for the number of trading days and length of calendar month prior to seasonal adjustment.

UNFILLED ORDERS

....at the end of a reporting period are orders that have not passed through the sales account and are equal to unfilled orders at the beginning of the period plus net new orders received during the period less net sales. Estimates for unfilled orders are obtained for each detailed category by multiplying the estimate for the preceding month by the link relatives based on a matched sample of reporting companies. The data for each company are inflated by their sampling weights before being summarized.

........NMTBA SERIES ON NEW ORDERS AND SHIPMENTS

........GROSS NEW ORDERS, minus CANCELLATIONS, equal NET NEW ORDERS

....The data are collected from participating companies and expanded to industry totals. The totals are adjusted periodically to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include only complete new machine tools and the accessories, attachments and tools ordered with them. They include only orders for machines to be built and assembled in the United States.

UNFILLED ORDERS

....Unfilled orders at the end of the reporting month are unfilled orders at the first of the month, plus new orders, less cancellations and less shipments. Any adjustments (due to corrections, price changes, etc.) are made through adjustments in cancellations, shipments or orders.

ORDNANCE AND ACCESSORIES, EXCEPT VEHICLES AND GUIDED MISSILES

........Major Group 348, Ordnance and Accessories, Except Vehicles and Guided Missiles, according to the Standard Industrial Classification, comprises Industry Groups

........3482. Small Arms Ammunition
3483. Ammunition, Except for Small Arms, not Elsewhere Classified
3484. Small Arms
3489. Ordnance and Accessories, Not Elsewhere Classified

OVERTIME

........See HOURS, OVERTIME

PAYROLL

........Includes the gross earnings paid in the calendar year to all employees on the payroll of operating manufacturing establishments.

Includes all forms of compensation directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds.

Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

PLANT AND EQUIPMENT, EXPENDITURES FOR NEW

........New plant and equipment expenditures refer to all costs (both replacement and expansion) chargeable to fixed asset accounts and for which depreciation accounts (see DEPRECIATION) are ordinarily maintained. Included in the totals are expenditures for new construction, machinery, and new equipment (automobiles, trucks, and other transportation equipment, furniture and fixtures, office machinery and all other new equipment). The figures do not include expenditures for land and mineral rights, maintenance and repair, used plant and equipment, and expenditures made in foreign countries.

PRECISION INSTRUMENTS

........This classification, used in the American Machinist 12th Inventory, is not listed in the Standard Industrial Classification. The closest category is SIC Major Group 38.

........See INSTRUMENTS AND RELATED PRODUCTS

PRICE INDEX ....

The CONSUMER PRICE INDEX measures the effect of price change on the living costs of all urban consumers. It is calculated by comparing, from one period to the next, the cost of a "market basket" of goods and services usually purchased by this particular population group. For more detail, see "The Consumer Price Index, A Short Description of the Index as Revised", U.S. Bureau of Labor Statistics.

The PRODUCER PRICE INDEX is designed to show the general rate and direction of the composite of price movements in primary markets. It is designed to measure "real" price changes between two periods of time, i.e. to measure price changes not influenced by changes in quality, quantity, terms of sale, level of distribution, unit prices or source of price. For a more detailed description, see U.S. Bureau of Labor Statistics Bulletin 1910, "BLS Handbook of Methods".

PRIMARY PRODUCTS

........The products of an establishment which exceed in value its production of products of any other single industry.

PRODUCERS' DURABLE EQUIPMENT

........Includes the new and replacement purchase of various types of machinery, automobiles, trucks and other equipment used by the private sector in the production of goods and services.

PRODUCTION WORKERS

........Production and related workers include working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial and watchman services, product development, auxiliary production for plant's own use, and record keeping and services closely associated with the above production operations.

PRODUCTIVITY

........The total output index divided by the labor input index, The labor input index is the index of hours worked by all persons (formerly called man-hours).

PROFITS

........See INCOME

REAL GNP

........U.S. real GNP data are arrived at by dividing components of the seasonally adjusted current-dollars Gross National Product by appropriate price indexes. About 142 product groups are deflated separately each quarter. The quarterly results are adjusted to the annual constant-dollar figures which are prepared in greater detail.

QUITS

........See LABOR TURNOVER

SALES, NET, TOTAL

........Net Sales are the dollar value of machine tool shipments less returns and allowances, including dealers' commissions, if any.

SALES

........are net of returns, allowances, and discounts.

SCHEDULED WEEKLY HOURS

........See HOURS, SCHEDULED, WEEKLY

SECONDARY PRODUCTS

........Products which do not account for the highest proportion of the total shipments of an establishment and are "primary" to another industry.

SEASONALLY ADJUSTED

........Allowances have been made for recurrent seasonal movements. Dividing actual data by seasonal indexes provides seasonally adjusted data.

SEPARATIONS

........See LABOR TURNOVER

SEVERITY OF WORK INJURIES

........See WORK INJURIES

SHIFT DIFFERENTIAL

........Premium paid above straight-time rates for late or night shift.

SHIPMENTS—TOTAL CENSUS

........The U.S. Bureau of the Census publishes data on the value of all machine tool shipments and miscellaneous receipts. This includes the shipments and receipts of the machine tool industry proper (See separate entry—the Machine Tool Industry) as well as the machine tool shipments made by other industries.

Included in these shipments by product class and industry are not only the major classes of products such as boring machines, drilling machines, presses, etc., but also machine tools primarily designed for home workshops, laboratories, etc., parts sold separately, rebuilt machine tools and some tools not specified by kind. Also included are "miscellaneous receipts" of the machine tool industry for such items as contract and commission work, sales of products bought and resold, repair work, etc.

Every five years, the Census of Manufactures collects these data in considerable detail by seven-digit product codes. More than one hundred metal cutting products and about 50 metal forming products are listed, many by quantity and value, in the Census of Manufactures publication on Metalworking Machinery and Equipment for metal cutting and metal forming machine tools (SIC 3541 and 3542).

In years which are not Census years, an Annual Survey of Manufactures is undertaken which permits compilation of product data for five-digit product classes. Data for non-Census years are estimates based upon reports received from a probability sample of all manufacturing establishments.

The Census of Manufactures and Annual Survey data differ from the totals given by the Current Industrial Reports, MQ-35W, and from the NMTBA reports on shipments. The major differences are listed below.

........The Current Industrial Reports, MQ-35W (See separate entry—SHIPMENTS— COMPLETE MACHINE TOOLS—MQ-35W) differ from the Census of Manufactures and Annual Survey primarily because

........1) they do not include machine tools designed primarily for home workshops, garages, etc.,
2) they do not include parts and rebuilt or used machines.

The Current Industrial Reports, MQ-35W differ from NMTBA shipment reports (See separate item—SHIPMENTS—COMPLETE MACHINE TOOLS NMTBA) primarily because NMTBA reports only on shipments of complete machine tools valued at $2,500 or more.

SHIPMENTS—COMPLETE MACHINE TOOL-MQ-35W

........Data on shipments of complete machine tools are collected quarterly by the Bureau of Census jointly with the Business and Defense Services Administration.

The figures are published in the Current Industrial Reports, Series MQ-35W, Metalworking Machinery.

This report differs from the Census products reports in that it excludes

........1) parts and rebuilt or used machine tools;
2) machine tools primarily designed for home workshops, garages, etc.

........Shipments are shown by 5- and 7-digit SIC codes. The classification of products is being developed jointly by government agencies and industry.

The MQ-35W report also includes separate data on numerically controlled machines and on manufacturers' exports.

The value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments and numerical controls that are ordered and shipped with the machines. Rebuilt machines, machine tools designed for use in home workshops, laboratories, garages, service shops, or for model making, imported machines, and power-driven hand tools are excluded.

SHIPMENTS—COMPLETE MACHINE TOOLS—NMTBA

........The National Machine Tool Builders' Association publishes a monthly report on orders and shipments for complete machine tools separated into metal cutting and metal forming and further subdivided into "domestic" and "foreign."

The data are collected from participating companies and expanded to industry totals. The totals are periodically adjusted to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include new machine tools and the accessories, attachments and tools which are ordered and shipped with them. They cover machines built and assembled in the United States.

NMTBA data are published during the month following the report month.

SHIPMENTS—MAJOR USERS AND MAJOR USER CATEGORIES

........The term "shipments" as used in Series M3-1, Manufacturers' Shipments, Inventories, and Orders, U.S. Bureau of the Census, represents manufacturers' receipts, billings, or the value of products shipped, less discounts, returns, and allowances. Shipments for exports as well as those for domestic use are included.

The shipment estimates are adjusted annually to the benchmark levels from the Annual Survey of Manufacturers. (See also MAJOR USERS.)

STOCKHOLDERS' EQUITY

........Assets minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see Federal Trade Commission—Securities and Exchange Commission, Quarterly Financial Report for Manufacturing Corporations.

STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

STRUCTURE AND ADDITIONS
........See PLANT AND EQUIPMENT

SUPPLEMENTARY BENEFITS
........See COMPENSATION, SUPPLEMENTARY

TAXES
........See INCOME TAXES

TRANSPORTATION EQUIPMENT
........The Major Group SIC 37, Transportation Equipment, consists of SIC Groups.

........371. Motor Vehicles and Motor Vehicle Equipment
372. Aircraft and Parts
373. Ship and Boat Building and Repairing
374. Railroad Equipment
375. Motorcycles, Bicycles and Parts
376. Guided Missiles and Space Vehicles and Parts
379. Miscellaneous Transportation Equipment

Each major group or industry group consists of the establishments classified according to their major activity.

UNFILLED ORDERS
........See ORDERS, UNFILLED

UNIT LABOR COST
........Unit labor cost is arrived at by dividing compensation per man-hour by output per man-hour.

VACATIONS, PAID
........See COMPENSATION, SUPPLEMENTARY

VALUE ADDED
........Value added by manufacture is derived by subtracting the total cost of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts, and adjusting the resulting amount by the net change in finished products and work-in-process inventories between the beginning and end of the year.

Value added by manufacture avoids the duplication in the value of shipments figure which results from the inclusion of the shipments of establishments producing materials and components along with the shipments of establishments producing finished products.

VALUE, IN FOREIGN COUNTRY
........See IMPORTS INTO THE UNITED STATES

VALUE, AT PORT
........See EXPORTS OF DOMESTIC MERCHANDISE

VALUE OF SHIPMENTS
........See SHIPMENTS

INDEX

—A—

Accessions, ix-x
  metal cutting machine tool industry, 238
Advanced processed goods, 25
Africa:
  machinery:
    imports, 232
  machine tools:
    exports, Sweden, 221
    imports, Sweden, 221
  U.S. exports:
  machine tools, 137
  metal cutting machine tools, 139
  metal forming machine tools, 141
  U.S. investment in, 47
Aircraft:
  capacity utilization, 25
  capital expenditures, 18
  new orders, 33
  production indexes, 27
  unfilled orders, 33
Aircraft engines and parts:
  in use, 265
Aircraft, missiles and parts, iii
Aircraft and parts industry:
  compensation, 242, 243
Appropriations, capital, 20
Argentina:
  industrial production, 225
  imports, 177
  machine tools:
    exports, 165, 166
      Czechoslovakia, 227
      Italy, 218
      Switzerland, 222
    imports, 165, 166
      Czechoslovakia, 227
      France, 215
      Italy, 218
      Switzerland, 222
    production, 165, 166
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools
    imports, Germany, 191
  U.S. exports:
    machine tools, 135
    metal cutting machine tools, 138
    metal forming machine tools, 140
Asia:
  capital expenditures, 14
  machinery:
    imports, 232
  metal cutting machine tools:
    imports, Germany, 190
  U.S. exports:
    machine tools, 137
    metal cutting machine tools, 149
    metal forming machine tools, 141
  U.S. investment in, 47
  see also specific countries
Assets, iii
  gross book value of depreciable assets, 21, 253
  net value of property, plant and equipment, 22
Australia:
  capital expenditures, 14
  cost recovery allowable for tax purposes, 56
  direct foreign investments in, 13
  machine tools:
    exports, 166, 167
      France, 217
      Spain, 211
      Sweden, 221
      Switzerland , 222
    imports, 165, 166
      France, 215

      Spain, 211
      Sweden, 221
      United Kingdom, 206, 207
    production, 165, 166.
  metal cutting machine tools:
    imports, Japan, 199
  U.S. exports:
    machine tools, 137
    metal cutting machine tools, 139
  U.S. investment in, 47
Australia and Oceania:
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools:
    imports, Germany, 191
Austria:
  machine tools:
    consumption, 163
    exports, 165, 166, 168, 169
      Czechoslovakia, 226
      France, 216
      Italy, 218
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
    imports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 215
      Italy, 216
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
    production, 165, 166 168, 169
  metal cutting machine tools:
    exports, 172
      Germany, 192
      Japan, 200
    imports, 171
      Germany, 190
    production, 170
  metal forming machine tools:
    exports, 172
      Germany, 193
    imports 171
      Germany 191
    production, 170
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 140, 141
  U.S. imports:
    cutting machine tools, 129
    forming machine tools, 129
    machine tools, 128
Automatic assembly:
  in use, 264
Automatic mechanical metalworking machinery:
  shipments, 102
  unfilled orders, 102
Average hourly earnings, v
Average straight-time hourly earnings, v
Average weekly earnings, v
Average weekly hours, viii

—B—

Backlog, xiii-iv
  of unspent appropriations, 20
  see also Unfilled orders
Balance of payments, 43
  worldwide, 53
Balance of trade, 12, 43
  machine tools, 123
  metal cutting tools, 124
  metal forming tools, 125
  worldwide, 53
Bar, tube, section drawing and forming machines:
  United Kingdom:
    shipments, 205
Belgium:
  cost recovery allowable for tax purposes, 56, 57
  gross national product:
    tax revenue as percent of, 58
  machine tools:
    exports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 216

      Italy, 218
      Netherlands, 223
    Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 208, 209
    imports, 165, 166, 167, 168
      Czechoslovakia, 227
      France, 215
      Italy, 216
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 206, 207
  production, 165, 166, 168
  169
  metal cutting machine tools:
    exports, 172
      Germany, 192
    imports, 171
      Germany, 190
    production, 170
  metal forming machine tools:
    exports, 172
      Germany, 193
    imports, 171
      Germany, 191
    production, 71
  U.S. exports:
    machine tools, 136
    metal cutting tools, 138
    metal forming tools, 140
  U.S. imports:
    cutting machine tools, 129
    forming machine tools, 129
    machine tools, 128
Bending machines:
  imports:
    EEC countries, 181
  Japan:
    exports, 195
    imports, 195
    production, 195
  shipments:
    value of, 119
Bending (and forming) machines:
    France
      production, 213
    Germany:
      exports, 191
    military prime contract
      awards for, 120
    shipments, 92, 98, 99, 117
    U.S. exports, 143, 145, 155
      manufacturers, 157, 158, 159
    U.S. imports of, 133
    in use, 264
Bending (and rolling) machines:
  Spain:
    exports, 210
    imports, 210
Bending (and straightening)
  machines:
  Germany:
    exports, 188
    imports, 189
    production, 187
Bending and forming tools:
  Germany:
    imports, 193
Benelux countries:
  machine tools:
    exports, 182, 183
    imports, 180, 181
Bolt, screw and nut making
  machines:
  Germany:
    exports, 188
    imports, 189
    production, 187
Bolt, screw and nut working
  machines:
  Germany:
    exports, 191
    imports, 193
Book value, 255
Boring machines:
  Canada:
    exports, 224
    imports, 224
  Czechoslovakia:
    production, 226
  France:
    exports, 217
    imports, 217

    - production, 212
  - exports, 147
    - worldwide, 172
  - imports, 126, 147
    - worldwide, 171
  - Japan:
    - exports, 196, 197, 198, 200
    - imports, 196, 198, 201
    - production, 196, 198
  - military prime contract awards for, 120
  - Netherlands:
    - exports, 223
    - imports, 223
  - production:
    - worldwide, 170
  - shipments, 92, 96, 97, 100, 103
    - value of, 119
  - United Kingdom:
    - exports, 206, 207
    - imports, 208, 209
    - shipments, 205, 204
  - U.S. exports, 144
    - manufacturers, 157, 158
  - U.S. imports of, 132
  - in use, 262
- Boring (and drilling) machines:
  - Germany:
    - exports, 188, 190
    - imports, 189, 191
    - production, 187
- Boring (drilling and milling) machines:
  - U.S. exports, 142
- Boring-milling machines:
  - exports:
    - EEC countries, 182
  - imports:
    - EEC countries, 180
  - Spain:
    - exports, 210
    - imports, 210
- Boring and vertical turret lathe:
  - U.S. imports of, 131
- Brazil:
  - imports, 175
  - machine tools:
    - consumption, 163
    - exports, 165, 166
      - Czechoslovakia, 224
      - Italy, 217
      - Spain, 211
      - Switzerland, 222
    - imports, 165, 166
      - Czechoslovakia, 227
      - France, 215
      - Italy, 218
      - Spain, 211
      - Switzerland, 222
      - United Kingdom, 206, 207
    - production, 165, 166
  - metal cutting machine tools:
    - imports, Germany, 190, 191
    - imports, Japan, 198, 200
  - U.S. exports:
    - machine tools, 136
    - metal cutting machine tools, 138
    - metal forming machine tools, 140
- Broaching machines:
  - imports:
    - EEC countries, 180, 182
  - Japan:
    - exports, 196
    - imports, 196
    - production, 196
  - military prime contract awards for, 120
  - shipments, 109-110
  - Spain:
    - exports, 210
    - imports, 210
  - Sweden:
    - exports, 220
    - imports, 220
    - production, 220
  - United Kingdom:
    - shipments, 205
  - U.S. exports, 142, 143
    - manufacturers, 158
  - in use, 262
- Budget, federal, 9
- Bulgaria:
  - machinery:
    - exports, 232

  machine tools:
    exports, 165, 166
      Czechoslovakia, 227
      France, 216
    imports, 165, 166
      Czechoslovakia, 165, 166
      France, 215
    production, 165, 166
    metal cutting machine tools:
    imports, Germany, 190
    production, 229
  metal forming machine tools:
    imports, Germany, 191
Burma:
  metal cutting machine tools:
    imports, Japan, 199
Business cycle:
  reference dates, 30
Business cycle indicators, 29

—C—

Canada:
  balance of trade, 53
  capital expenditures, 14
  compensation, 53, 55, 247
  consumer prices, 48, 49
  cost recovery allowable for tax purposes, 56, 57
  direct foreign investments in, 13
  exports:
    financing, 46
    unit value of, 51
  gross national product, 44
    tax revenue as percent of, 58
  imports, 174
  industrial production, 47
  investment patterns, 45
  machinery:
    imports, 232
  machine tools:
  consumption, 163
  exports, 165, 166, 223
    Czechoslovakia, 226
    France, 216
    Italy, 217
    Spain, 211
    Sweden, 221
    Switzerland, 222
    United Kingdom, 208, 209
  imports, 165, 166, 223
    Czechoslovakia, 227
    France, 215
    Italy, 218
    Spain, 211
    Sweden, 221
    Switzerland, 222
    United Kingdom, 206, 207
  production, 165, 166
  in use, 259
  metal cutting machine tools:
    imports, Germany, 190
    imports, Japan, 119
  metal forming machine tools:
    imports, Germany, 191
  productivity, 54, 55
  trade, 52
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 140
  U.S. imports:
    cutting machine tools, 129
    forming macnine tools, 129
    machine tools, 128
  U.S. investment in, 47
  wholesale prices, 49, 50
Cancellations, iii
  metal cutting tools, 79
    metal forming tools, 79
Capacity utilization, 24, 25, 26, iii
Capital appropriations, 20
Capital expenditures, 254, 255
  durable goods industries and, 16, 17
  foreign affiliates of U.S. companies, 14
  machine tool industries, 18
  major industries, 15
  new projects, 15
  see also Plant and equipment
Capital formation:
  gross national product and, 45
  manufacturing industries, 19

Capital goods industries, iii
  inventories, 31
  new orders, 32
  shipments, 34
  unfilled orders, 32
Central America:
  machine tools:
    exports, Sweden, 221
    imports, Sweden, 221
  U.S. exports:
    machine tools, 136
    metal cutting, 138
    metal forming, 140
  see also specific countries
Chile:
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools:
    imports, Germany, 191
  U.S. exports:
    machine tools, 136
    metal cutting, 138
    metal forming, 140
China:
  gross national product, 44
  imports, 178
  machine tools:
    consumption, 163
    exports, 165, 166
    imports, 166, 167
    production, 165, 166
  see also People's Republic of China
Coil handling machines:
  in use, 264
Colombia:
  U.S. exports:
    machine tools, 137
    metal cutting, 139
    metal forming, 141
Communist countries:
  machinery:
    exports, 232
    imports, 232
  machine tools:
    exports, 232
    imports, 230, 231
  metal cutting machine tools, production, 230
  trade, 51, 52
  U.S. trade with, 52
  see also specific countries
Compensation, 233, 236, 237
  v, xiv
  aircraft and parts industry, 242, 243
  durable goods industries, 242, 243
  machinery manufacturing industry, 246, 247
  machine tool industry, 236
    France, 214
  in manufacturing, 28
  metal cutting machinery industry, 242, 243
  metal cutting machine tool industry, 237, 241, 243
  metal forming machine tool industry, 236, 244
  metalworking machinery industry, 241, 242, 243
  motor vehicles and equipment industry, 242, 243
  nonelectrical machinery industry, 243, 244
  worldwide, 53, 55, 246, 247
Compensation, supplementary, iii-iv
Constant dollars, iv, viii
Consumer price index, xiv-xv
Consumer prices:
    worldwide, 48, 49
Consumption, iv
  leading nations, 163
  machine tool:
    imports as percent of domestic, 184-185
    U.S. machine tool imports and, 126, 127
    worldwide machine tool, 162
Controls, xiii
Corporate capital consumption allowances, iv
Corporate profits:
  actual and projected, 7
  tax and, 8

Cost of materials, 62, 63, xii
Cost recovery allowable for tax purposes:
  worldwide, 56, 57
Coverage ratio, 59
Cuba:
  machine tools:
    exports, Czechoslovakia, 227
    imports, Czechoslovakia, 227
Cutoff and sawing machines:
  in use, 262
Cutting machines:
  Netherlands:
    exports, 223
    imports, 223
Cutting machine tools:
  imports of, 129
  see also Exports; Imports
Czechoslovakia:
  imports, 178
  machinery:
    exports, 232
  machine tools:
    consumption, 163
    exports, 165, 166, 226-227
      France, 216
      Italy, 218
      Spain, 211
      Switzerland, 222
      United Kingdom, 208, 209
    imports, 165, 166, 226-227
      France, 216
      Italy, 218
      Spain, 211
      Switzerland, 222
    production, 165, 166
  metal cutting machine tools:
    exports, 226
      Germany, 192
      Japan, 200
    imports, 226
      Germany, 190
    production, 226, 229
  metal forming machine tools:
    exports, 226
      Germany, 193
    imports, 225
      Germany, 191
    production, 225
  U.S. imports:
    cutting machine tools, 120
    machine tools, 128

—D—

Defense:
  inventories, 31
  new orders, 32
  products, iv
  shipments, 34
  unfilled orders, 32
Defense contracts:
  for machine tools, 120
Defense purchasing:
  price deflators, 39
  type of product, 39
Denmark:
  gross national product:
    tax revenue as percent of, 58
  machine tools:
    exports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 215
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
    imports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 215
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 206, 207
    production, 165, 166, 168, 169
  metal cutting machine tools:
    exports, 172
      Germany, 192
    imports, 171
      Germany, 191
    production, 170
  metal forming machine tools:
    exports, 172
      Germany, 193
    imports, 171
      Germany, 191

    production, 170
  productivity, 54
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 130
  U.S. imports:
    cutting machine tools, 129
    machine tools, 128
Depreciation, 253, 255, iv
  capital formation, 19
  cost recovery allowable for tax purposes and, 56-57
Developed countries:
  trade, 52
  U.S. investment in, 47
  see also specific countries
Developing countries:
  imports, 175
  see also specific countries
Differential, shift, iv, xv
Direct foreign investments, 13
Domestic orders, shipments, unfilled orders, cancellations, v
Drilling machines:
  Canada:
    exports, 224
    imports, 224
  Czechoslovakia:
    production, 226
    exports, 148
    worldwide, 172
  France:
    exports, 217
    imports, 217
    production, 212, 213
  imports, 126, 148
    EEC countries, 183
    worldwide, 171
  Japan:
    exports, 196, 197, 198, 200
    imports, 196, 198, 201
    production, 196, 198
  military prime contract awards for, 120
  production:
    worldwide, 170
  shipments, 92, 96, 97, 100 104
    value of, 118
  Spain:
    exports, 210
    imports, 210
  Sweden:
    exports, 220
    imports, 220
    production, 220
  United Kingdom:
    exports, 206, 207
    imports, 208, 209
    shipments, 203, 204
  U.S. exports, 144
  U.S. imports of, 131, 132
  in use, 264
Dubai:
  machine tools:
    imports, United Kingdom, 205
Durable goods, v
  capacity utilization, 25, 26
  capital appropriations and backlog of, 20
  defense purchases, 39
  inventories, 31
  new orders, 32
  production indexes, 27
  shipments, 34
  unfilled orders, 32
Durable goods industries, v
  capital expenditures, 15, 16, 17, 18
  compensation, 242, 243
  new projects, 15
  overtime hours, 245
  shipments, 4, 5
Durable manufactures:
  producer price indexes for, 41

—E—

Earnings, v
  see also Compensation
Eastern bloc countries:
  machine tools:
    exports, Netherlands, 223
    imports, Netherlands, 223

  - see also Communist countries
- Eastern Europe:
  - imports, 177
  - metal cutting machine tools:
    - exports, Japan, 201
    - production, 229
  - U.S. trade with, 52
  - see also specific countries
- East Germany:
  - machine tools:
    - consumption, 163
    - exports, 165, 166
      - Czechoslovakia, 224
      - France, 216
      - Italy, 218
      - Spain, 211
      - Switzerland, 222
      - United Kingdom, 205
    - imports, 165, 166
      - Czechoslovakia, 227
      - France, 215
      - Italy, 218
      - Spain, 211
      - Switzerland, 222
    - production, 165, 166
  - machinery:
    - exports, 232
  - machine tools:
    - shipments, 164
  - metal cutting machine tools:
    - exports, Japan, 200
    - production, 229
  - U.S. imports:
    - cutting machine tools, 129
    - machine tools, 128
- Ecuador:
  - U.S. exports:
    - machine tools, 136
    - metal cutting, 138
    - metal forming, 140
- Edging machines:
  - Netherlands:
    - exports, 223
    - imports, 223
- Egypt:
  - machine tools:
    - exports, Czechoslovakia, 227
    - imports:
      - Czechoslovakia, 227
      - United Kingdom, 205
  - U.S. exports:
    - machine tools, 137
    - metal cutting, 139
    - metal forming, 141
- Electrical discharge machines:
  - U.S. exports, 142, 144
  - U.S. imports, 132
- Electrical machinery, v
  - capacity utilization, 25, 26
  - capital expenditures, 15, 18
  - gross book value of depreciable assets, 21
  - inventories, 31
  - machine tools:
    - in use, 262
  - net value of property, plant, and equipment, 22
  - new orders, 33
  - new projects, 15
  - producer price indexes, 38
  - shipments, 34
  - unfilled orders, 33
  - in use, 264, 265
- Electrical and ultrasonic erosion machines:
  - military prime contracts awards for, 120
- Employment, 233
  - machine tool industry, 235, 236
    - France, 211
  - metal cutting machine tool industry, 237, 238, 240, 244
  - metal forming machine tool industry, 236, 244
- Equipment and plant:
  - expenditures:
    - actual and projected, 7
  - orders for, 29
- Equity, xvii
- Establishment, v
- Europe:
  - capital expenditures, 14
  - machinery:
    - imports, 232
  - U.S. exports:

    - machine tools, 136
    - metal cutting, 138
    - metal forming, 140
  - see also Western Europe
- European Economic Community (EEC):
  - direct foreign investments in, 13
  - exports:
    - unit value of, 51
  - gross national product, 44
  - industrial production, 47
  - machine tools:
    - exports, 182, 183
    - imports of, 180, 181
  - trade, 52
  - U.S. investment in, 47
  - see also specific countries
- Exchange rates, v
- Expenditures, see Capital expenditures
- Expenditures for durable goods:
  - actual and projected, 7
- Expenditures on new plant and equipment, xiv
- Exports, vi-vii
  - bending and forming machines, 155
  - boring machines, 147
  - drilling machines, 148
  - financing, 46
  - forging machines, 155
  - gear cutting and finishing machines, 149
  - grinding and polishing machines, 150
  - lathes, 147, 151
  - machine tools, 123, 135, 146
    - by destination, 136, 137
    - East Germany, 167
    - European Economic Commununity, 167
    - Japan, 167
    - percent of world machine tool consumption, 135
    - U.S., 167
    - West Germany, 167
    - worldwide, 165, 166, 167, 168, 169
  - machining centers, 153
  - milling machines, 152
  - manufacturers, 156, 159
  - market shares, 173-179
  - metal cutting machine tools, 146, 154
    - by destination, 136-139
    - European Economic Community countries, 182
    - by machine classification, 142, 144
    - manufacturers' exports, 156, 158
    - worldwide, 165-166, 169
  - metal cutting tools, 124
  - metal forming machine tools, 146, 155
    - by destination, 136-137, 140-141
    - European Economic Community countries, 183
    - by machine classification, 144, 145
    - manufacturers' exports, 156, 159
    - worldwide, 165-166, 169, 172
  - metal forming tools, 125
  - presses, 155
  - punching and shearing machines, 155
  - United States:
    - Communist countries, 31
    - goods and services, 6
  - unit value of, 51
  - worldwide, 52
  - see also specific countries

—F—

- Fabricated metal products, vii
  - capacity utilization, 26
  - capital expenditures, 18
  - gross book value of depreciable assets, 21
  - inventories, 31
  - machine tools:
    - in use, 262
  - net value of property, plant, and equipment, 22
  - new orders, 32
  - production indexes, 27

    shipments, 34
    unfilled orders, 32
  in use, 263
  see also Industrial production
Federal budget, 9
Federal Republic of Germany:
  capital expenditures, 14
  compensation, 242, 243
  see also West Germany
Female employees, 240
Finland:
  machine tools:
    exports, France, 216
      Sweden, 221
    imports, France, 215
      Sweden, 221
  U.S. exports:
    machine tools, 137
    metal cutting, 138
    metal forming, 140
Folding machines:
  imports:
    European Economic Community countries, 181
Foreign investment, direct U.S., 13, vii
Foreign orders, shipments, unfilled orders, and cancellations, vii
Foreign trade:
  metal cutting, 124
  metal forming, 124
  see also Balance of trade; Exports; Imports; and specific countries
Forging machines:
France:
    exports, 217
    imports, 217
  imports:
    worldwide, 171
  Japan:
    exports, 195
    imports, 195
    production, 195
  production:
    worldwide, 170
  shipments, 98, 99, 118
  United Kingdom:
    shipments, 205
  U.S. exports, 143, 145, 155
    manufacturers, 159
  U.S. imports of, 133
  in use, 264
Forging machines and hammers:
  military prime contract awards for, 120
Forging machines and presses:
  U.S.S.R.:
    production, 225
Forging and stamping machines:
  exports:
    European Economic Community countries, 183
  Spain:
    exports, 210
    imports, 210
Forming machine tools:
  imports of, 129
  Netherlands:
    exports, 223
    imports, 223
    see also Exports; Imports
France:
  balance of trade, 53
  capital expenditures, 14
  compensation, 53, 55, 246, 247
  consumer prices, 48, 49
  cost recovery allowable for tax purposes, 56, 57
  export market share of, 173-179
  exports:
    financing, 46
    unit value of, 51
  gross national product, 44
  tax revenue as percent of, 58
  imports, 174
  industrial production, 47
  investment patterns, 45
  machine tools:
    consumption, 163
    employment, 211
    exports, 165, 166, 168, 169 182, 183, 212

    Communist countries, 230-231
    Czechoslovakia, 227
    Italy, 218
    Netherlands, 222
    Spain, 211
    Sweden, 221
    Switzerland, 222
    United Kingdom, 208, 208, 209
  imports, 165, 166, 168, 169
    180, 181, 216
    Czechoslovakia, 227
    France, 215
    Italy, 218
    Netherlands, 223
    Spain, 211
    Sweden, 221
    Switzerland, 222
    United Kingdom, 206, 207
  production, 165, 166,
    168, 169
  shipments, 164, 214
  in use, 259
metal cutting machine tools:
  exports, 172, 217
    Germany, 193
    Japan, 200, 201
  imports, 170, 217
    Germany, 190
  production, 170, 212
metal forming machine tools:
  exports, 172, 217
    Germany, 193
  imports, 171, 217
    Germany, 191
  production, 170, 213
numerically controlled machine
  tools:
  exports, 214
  production, 214
productivity, 54, 55
trade, 52
U.S exports:
  machine tools, 136
  metal cutting, 139
  metal forming, 141
U.S. imports:
  cutting machine tools, 129
  forming machine tools, 129
    machine tools, 128, 134
  U.S. investment in, 47
  wholesale prices, 49, 50
Fringe benefits, iii-iv
Furniture and fixture
  industry, vii

—G—

Gear cutting machines:
  France:
    exports, 217
    imports, 217
    production, 212, 213
  Germany:
    exports, 188, 190
    imports, 189, 192
    production, 187
  imports:
    European Economic Community countries, 180, 182
  Spain:
    exports, 210
    imports, 210
  Sweden:
    exports, 220
    imports, 220
    production, 220
  U.S. exports:
    manufacturers, 157, 158
  in use, 262
Gear cutting (and finishing)
  machines:
  exports, 149
    worldwide, 172
  imports, 149
    worldwide, 171
  Japan:
    exports, 197
    imports, 201
  military prime contract awards
    for, 119
  production:
    worldwide, 170
  shipments, 92, 96, 97, 103
    value of, 119
  United Kingdom:
    exports, 206, 207
    imports, 208, 209

shipments, 204
Gear cutting (and hobbing) machines:
  imports, 126
  U.S. imports, 131
Gear hobbing machines:
  Japan:
    exports, 196
    imports, 196
    production, 196
Germany:
  capital expenditures, 14
  compensation, 247, 248
  see also West Germany
Government purchases:
  goods and services, 6
Government receipts:
  gross national product, 8
Greece:
  machine tools:
  exports, Italy, 218
  imports, France, 215
    Italy, 216
    United Kingdom, 205
  U.S. exports:
    machine tools, 136
    metal cutting, 138
    metal forming, 140
Grinding machines:
  Canada:
    exports, 224
    imports, 224
  Czechoslovakia:
    production, 226
  imports:
    European Economic Community countries, 180, 182
  Japan:
    exports, 196, 197, 198 200
    imports, 196, 198, 201
    production, 196, 198
  military prime contract awards for, 120
  U.S. exports, 144
    manufacturers, 157, 158
  U.S. imports of, 131, 132
  in use, 262
Grinding (and finishing) machines:
  U.S. exports, 142, 144
Grinding (honing and polishing) machines:
  Germany:
    exports, 188, 190
    imports, 189, 192
    production, 187
  Netherlands:
    exports, 223
    imports, 223
Grinding (and polishing) machines:
  exports, 150
    worldwide, 172
  France:
    exports, 217
    imports, 217
  imports, 126, 150
    worldwide, 171
  production:
    worldwide, 170
  shipments, 92, 96, 97, 101, 107, 108
    value of, 119
  Spain:
    exports, 210
    imports, 210
  Sweden:
    exports, 220
    imports, 220
    production, 220
  United Kingdom:
    exports, 206, 207
    imports, 208, 209
    shipments, 205
Grinding (polishing, honing and lapping) machines:
  France:
    production, 212, 213
Gross National Product (GNP), vii, xv
  actual and projected, 7
  components, 6
  fixed capital formation and, 45
  government receipts, 8

  - machine tools and, 4, 5
  - price deflators, 7
  - private investments and, 10, 11
  - tax revenues as percent of, 58
  - trends, 44
  - worldwide, 44
- Gross new orders, xiii-xiv
  - see also New orders; Unfilled orders
- Gross private domestic investment, vii

—H—

- Hammers:
  - military prime contract awards for, 120
  - Sweden:
    - exports, 220
    - imports, 220
    - production, 220
- Hammers, forging and riveting machines:
  - Germany:
    - exports, 188, 191
    - imports, 189, 193
    - production, 187
- Headers and upsetters:
  - U.S. exports, 143, 145
- Health, insurance and retirement plans, iii-iv
- Holidays, paid, iii-iv
- Hong Kong:
  - U.S. exports:
  - machine tools, 137
  - metal cutting, 139
  - metal forming, 141
- Honing machines:
  - in use, 264
- Honing (and lapping) machines:
  - imports:
    - European Economic Community countries, 180
- Honing (polishing and lapping) machines:
  - imports:
    - European Economic Community countries, 182
- Hours, 28, 29
  - metal cutting machine tool industry, 238, 241, 244
  - metal forming machine tool industry, 244
  - metalworking machinery industry, 241
  - overtime, 245
- Hours, average weekly, viii
- Hours, overtime, viii
- Hours, scheduled, weekly, viii
- Hungary:
  - imports, 179
  - machine tools:
    - consumption, 163
    - exports, 165, 166, 232
      - Czechoslovakia, 227
      - France, 216
      - Switzerland, 222
    - imports, 165, 166
      - Czechoslovakia, 227
      - France, 215
      - Switzerland, 222
      - United Kingdom, 205
    - production, 165, 166
  - metal cutting machine tools:
    - exports, Germany, 192
    - imports, Germany, 190
    - production, 229
  - metal forming machine tools:
    - exports, Germany, 193
    - imports, Germany, 191
- Hydraulic presses:
  - exports:
    - European Economic Community countries, 183
  - France:
    - exports, 217
    - imports, 216
  - Germany:
    - exports, 188, 191
    - imports, 189, 193
    - production, 187
  - imports:
    - European Economic Community countries, 181
  - Japan:
    - exports, 195

    imports, 195
    production, 195
  Netherlands:
    exports, 223
    imports, 223
Hydraulic (and pneumatic)
  presses, 114
  military prime contract awards for, 120
  U.S. exports, 143, 145
      manufacturers, 157, 158
  U.S. imports of, 133
  in use, 264
Hydraulic shearing machines:
  exports:
    European Economic Community countries, 183
  imports:
    European Economic Community countries, 181

—I—

Implicit price deflator, viii
Income, ix
Imports, viii-ix
  boring machines, 147
  cutting machine tools:
    countries of origin, 129
  drilling machines, 148
  forming machine tools:
    countries of origin, 129
  gear cutting and finishing machines, 149
  grinding and polishing machines, 150
  lathes, 147, 151
  machine tools, 123, 146
    countries of origin, 128
    by machine classification, 131
    as percentage of U.S. machine tool consumption, 126
    worldwide, 165-166, 168, 169
  machining centers, 153
  metal cutting, 146, 154
    by machine, 131, 132
    European Economic Community countries, 180
    worldwide, 165-166, 169, 171
  metal cutting tools, 124
  metal forming machine tools, 146 155
    European Economic Community countries, 181
    worldwide, 165-166, 169, 171
  metal forming tools, 125
  milling machines, 152
  unfilled orders and, 130
  U.S.:
    Communist countries, 52
  worldwide, 52
  see also specific countries
India:
  imports to, 176
  machine tools:
    consumption, 165
    exports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 216
      Switzerland, 222
    imports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 215
      Switzerland, 222
      United Kingdom, 205
    production, 165, 166, 168, 169
  metal cutting machine tools:
    exports, 172
    imports, 171
      Germany, 190
    production, 170
  metal forming machine tools:
    exports, 172
    imports, 171
      Germany, 191
    production, 170
  U.S. exports:
    machine tools, 137
    metal cutting machine tools, 139
    metal forming machine tools, 141
Indicators:
  business cycle, 29
Indonesia:
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools:
    imports, Germany, 191

Industrial production, 28, xv
  actual and projected, 7
  indexes of, 27
  worldwide, 47, 54, 55
Industrial production, total, ix
Injury rates, 243
Instruments:
  inventories, 31
  net value of property, plant, and equipment, 22
  production indexes, 27
  shipments, 34
Instruments and related products, ix
Interest rates:
  on business loans, 23
International investment patterns, 45
Inventories, ix
  actual and projected, 7
  machine tool industry, 72
  of manufacturers, 31
  net change, 29
Inventory turnover, 253
Investment:
  capital formation and, 19
  direct foreign, 13
  gross domestic, 6
  gross national product and, 10, 11
  U.S.:
    abroad, 47
Investment, patterns, international, 45
Iran:
  machine tools:
    exports, Czechoslovakia, 227
    imports, Czechoslovakia, 227
      France, 215
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools:
    imports, Germany, 191
  U.S. exports:
    machine tools, 137
    metal cutting, 139
    metal forming, 141
Iraq:
  machine tools:
    imports, United Kingdom, 206, 207
Ireland:
  machine tools:
    imports, United Kingdom, 205
  U.S. exports:
    machine tools, 136
    metal cutting, 138
    metal forming, 140
Israel:
  machine tools:
    exports, Switzerland, 222
    imports, France, 215
      Switzerland, 222
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools,
    imports, Germany, 191
  U.S. exports:
    machine tools, 137
    metal cutting machine tools, 139
    metal forming machine tools, 141
Italy:
  balance of trade, 53
  capital expenditures, 14
  compensation, 53, 55, 248, 249
  consumer prices, 48, 49
  cost recovery allowable for tax purposes, 56, 57
  export market share of, 173-179
  exports:
    unit value of, 51
  gross national product, 44
    tax revenue as percent of, 58
  industrial production, 47
  investment patterns, 45
  machine tools:
    consumption, 163
    exports, 165, 166, 168, 169, 182, 183, 218, 219, 220
      Communist countries, 230-231
      Czechoslovakia, 226

- France, 216
- Netherlands, 223
- Spain, 211
- Sweden, 221
- Switzerland, 222
- United Kingdom, 208, 209
- imports, 165, 166, 168, 169 180, 181, 218-220
  - Czechoslovakia , 227
  - France, 215
  - Netherlands, 223
  - Spain, 211
  - Sweden, 221
  - Switzerland, 222
  - United Kingdom, 205
- production, 165, 166, 168, 169, 219
  - shipments, 164
  - in use, 261
- metal cutting machine tools:
  - exports, 172
    - Germany, 192
    - Japan, 200
  - imports, 171
    - Germany, 190
  - production, 170
- metal forming machine tools:
  - exports, 172
    - Germany, 191
  - imports, 171
    - Germany, 193
  - production, 170
- productivity, 54, 55
- trade, 52
- U.S. exports:
  - machine tools, 136
  - metal cutting, 137
  - metal forming, 140
- U.S. imports:
  - cutting machine tools, 129
  - forming machine tools, 129
  - machine tools, 128, 134
- wholesale prices, 49, 50

—J—

- Japan:
  - balance of trade, 53
  - capital expenditures, 14
  - compensation, 53, 55, 246 247
  - consumer prices, 48, 49
  - cost recovery allowable for tax purposes, 56, 57
  - direct foreign investments in, 13
  - export market share of, 173-179
  - exports:
    - financing, 46
    - unit value of, 51
  - gross national product, 44
    - tax revenue as percent of, 58
  - imports:
    - percent of domestic consumption, 184
  - imports, 175
  - industrial production, 47
  - investment patterns, 45
  - machine tools:
    - consumption, 163
    - exports, 164, 166, 168, 169
      - Communist countries, 230-231
      - Czechoslovakia, 227
      - France, 216
      - Italy, 218
      - Spain, 211
      - Sweden, 221
      - Switzerland, 222
      - United Kingdom, 205
    - imports, 165, 166, 168, 170, 232
      - Czechoslovakia, 226
      - France, 215
      - Italy, 218
      - Spain, 211
      - Sweden, 221
      - Switzerland, 222
      - United Kingdom, 205
    - production, 165, 166, 168, 169
    - shipments, 164
    - in use, 259
  - metal cutting machine tools:
    - domestic demand, 194

    employment in, 195
    exports, 172, 194, 196, 197, 198, 200
      Germany, 192
    imports, 171, 194, 196, 200, 201
      Germany, 190
    production, 170, 194, 196
  metal forming machine tools:
    exports, 172, 194, 195
      Germany, 193
    imports, 171, 194, 195,
      Germany, 191
    production, 170, 194, 195
  numerically controlled metal cutting machine tools:
    exports, 198
    imports, 198
    production, 198
  productivity, 54, 55
  trade, 52
  U.S. exports:
    machine tools, 137
    metalcutting, 139
    metal forming, 141
  U.S. imports:
    cutting machine tools, 129
    forming machine tools, 129
    machine tools, 128, 134
  U.S. investment in, 47
  wholesale prices, 49, 50
Jig boring and milling machines:
  imports:
    European Economic Community countries, 182

—K—

Korea:
  machine tools:
    consumption, 163
    exports, 165, 166
    imports, 165, 166
    production, 165, 166
  see also Korea, Republic of; Republic of Korea
Korea, Republic of:
  U. S. exports:
    machine tools, 137
    metal cutting, 138
  see also Korea; Republic of Korea

—L—

Labor cost:
  supplementary, 248
Labor turnover, ix-x
  metal cutting industry, 239
Lapping machines:
  in use, 263
Lathes:
  Canada:
    exports, 224
    imports, 224
  Czechoslovakia:
    production, 226
    exports, 147, 151
      European Economic Community countries, 182
      worldwide, 172
    France:
      exports, 217
      imports, 217
      production , 210
  Germany:
    exports, 188
    imports, 189, 192
    production, 187
  imports, 126, 147, 15
      European Economic Community countries, 180
      worldwide, 171
  Japan:
    exports, 196, 197, 198, 200
    imports 196, 198, 201
    production, 196, 198
  military prime contract awards for, 119
  Netherlands:
    exports, 223
    imports, 223
  production:
    worldwide, 170
  shipments, 92, 96, 97, 98 105, 106

    - value of, 119
  - Spain:
    - exports, 210
    - imports, 210
  - Sweden:
    - exports, 220
    - imports, 220
    - production, 220
  - U.S. exports, 142, 144
    - manufacturers, 157, 158
  - U.S. imports of, 131, 132
  - United Kingdom:
    - exports, 206, 207
    - imports, 208, 209
    - shipments, 205, 204
- Latin America:
  - capital expenditures, 14
  - direct foreign investments in, 13
  - machinery:
    - imports, 233
  - U.S. investment in, 47
- Layoff rate:
  - manufacturing, 29
- Layoffs, ix-x
  - metal cutting machine tool industry, 240
- Leading indicators, x
- Lebanon:
  - machine tools:
  - imports, France, 215
- Loans:
  - interest rates on, 23
- Luxembourg:
  - gross national product:
    - tax revenue as percent of, 58

—M—

- Machinery:
  - capacity utilization, 25, 26
- Machinery and equipment industries, xi
- Machinery, except electrical:
  - see Nonelectrical machinery
- Machine tools, x-xi
  - balance of trade, 12
  - capital expenditures, 18
  - consumption, 126, 127
    - durable goods industries, 17
  - cost of material, 62
  - definition, 1, 59, xi
  - employees, 62, 64, 69
  - establishments, 62, 64, 69
  - inventories, 72
  - location of, 60-61, 64
  - materials consumed by, 73, 74
  - military prime contract awards for, 120
  - national economy and, 4, 5
  - new orders, 33, 36
  - number of companies, 69
  - producer price indexes, 38, 41
  - shipments, 1, 4, 5, 34, 35, 40, 42, 84-86
    - by numerically controlled, 100-101
    - by type of machine, 92
    - by value of machine, 93
  - size of, 60
  - unfilled orders, 33, 37
  - in use, 260, 261, 262, 263, 264
    - metalworking industries, 260-265
  - users, 1
  - value added by manufacturer, 62, 64
  - value of shipments, 62, 64
  - see also Exports; Imports; Metal cutting machine tools; Metal forming machine tools; Shipments; specific countries
- Machining centers:
  - exports, 153
  - imports, 153
  - Japan:
    - exports, 196, 197, 198
    - imports, 196, 198
    - production, 196, 198
  - military prime contract awards for, 120
  - shipments, 101, 111
  - United Kingdom:

    - shipments, 203, 204
  - U.S. imports of, 132, 133
- Major users, see specific industry groups
- Man-hours, xi
- Manual presses:
  - military prime contract awards for, 120
- Manufacturing industries:
  - capital expenditures, 15
  - shipments, 4, 5
  - U.S. investment in foreign, 47
- Manufacturers:
  - inventories, 31
  - new orders of, 32, 33
  - shipments of, 34
  - unfilled orders of, 32, 33
  - see also Orders; Shipments
- Manufacturers' export shipments, see Exports
- Market category, see Defense Equipment industries; specific industry groups
- Market shares, xii
  - exports, 173-179
- Materials, xii
  - cost of, 62, 63
  - machine tool industry, 38, 73
  - metal cutting industry, 73
  - metal forming industry, 73
- Mechanical presses:
  - France:
    - exports, 217
    - imports, 217
  - Germany:
    - exports, 188, 191
    - imports, 189, 193
    - production, 187
  - Japan:
    - exports, 195
    - imports, 195
    - production, 195
  - military prime contract awards for, 120
  - shipments, 115
  - U.S. exports, 143, 145
    - manufacturers, 157, 158
  - in use, 264
- Metal container-making machines:
  - U.S. exports, 143, 145
- Metal cutting machine tools:
  - cancellations, 79
  - capital expenditures, 254
  - compensation, 242, 243
  - cost of materials, 63
  - coverage ratio in, 59
  - employees, 63, 65, 67, 70
  - employment, 233
  - establishments, 63, 65, 67, 70
  - foreign trade, 124
  - Germany:
    - exports, 189
    - imports, 190
  - imports, 126
  - location, 65, 67
  - by machine, 131, 133
  - materials consumed by, 73, 74
  - new orders, 78, 79, 82-83, 88-91
  - number of companies, 70
  - primary specialization ratio, 59
  - producer price indexes, 38, 41
  - production, 1
    - worldwide, 163
  - products of, 73
  - shipments, 42, 77, 82-87
    - by class of product, 96-97
    - by type of machine, 92
    - value of, 119
    - by value of machine, 93-94
  - total machine tools in use, 258
  - unfilled orders, 79
  - U.S. imports of, 132
  - in use, 260, 261
  - value added by manufacturer, 63, 65, 67
  - value of shipments, 63, 65, 67
  - see also Machine tools: Numerically controlled metal cutting machine tools; Production; specific classes of products; specific countries; specific metal cutting tools
- Metal forging stamping machinery and parts:

  Canada:
    imports, 224
Metal forming machine tools, 254
  cancellations, 79
  cost of materials, 63
  coverage ratio in, 59
  employees, 63, 66, 68, 71
  employment, 233
  establishments, 63, 66, 68, 71
  foreign trade, 125
  Germany:
    exports, 188
    imports, 189
  imports, 126
  location of, 66, 68
  by machine, 131, 133
  materials consumed by, 73, 74
  new orders, 78, 79, 82-83, 88-91
  number of companies, 71
  primary specialization ratio, 59
  producer price indexes, 38, 41
  production:
    worldwide, 163
  products, 73
  shipments, 42, 77, 82-87, 113, 117
    by types of machine, 92, 98-99
    value of, 119
    by value of machine, 93, 95
  total machine tools in use, 260
  unfilled orders, 79
  in use, 262, 263
  value added by manufacturer, 63, 66, 68
  value of shipments, 63, 66, 68
  see also Machine tools; Production; specific countries; specific metal forming machine tools
Metal furniture:
  machine tools:
    in use, 262
  in use, 265
Metalworking industry, 261, xii
  capacity utilization, 26
  compensation, 242, 243
  machine tools in use, 260, 261
  new orders, 36
  overtime hours, 243
  price deflators, 7
  producer price indexes, 38
  shipments, 35
  unfilled orders, 37
  in use, 265
Metalworking presses:
  Canada:
    exports, 224
    imports, 224
Mexico:
  imports, 176
  machine tools:
    exports, 165, 166
      Czechoslovakia, 227
      Italy, 218
      Spain, 211
      Switzerland, 222
    imports, 165, 166
      Czechoslovakia, 227
      France, 215
      Italy, 218
      Spain, 211
      Switzerland, 222
      United Kingdom, 205
    production, 165, 166
  metal cutting machine tools:
    imports, Germany, 190
  metal forming machine tools:
    imports, Germany, 191
  U.S. exports:
    machine tools, 136
    metal cutting, 138
    metal forming, 140
Middle East:
  U.S. investment in, 47
Military contract awards:
  for machine tools, 120
Milling machines:
  Canada:
    imports, 224
  Czechoslovakia:
    production, 226
  exports, 152
    worldwide, 172
  France:
    exports, 217
    imports, 217
    production, 212, 213

Germany:
  exports, 188, 190
  imports, 189, 192
  production, 187
imports, 127, 153
    European Economic Community, 182
    worldwide, 171
Japan:
    exports, 196, 197, 198, 200
    imports, 196, 198, 201
    production, 197, 198
military prime contract awards for, 120
Netherlands:
  exports, 223
  imports, 223
production:
  worldwide, 170
shipments, 92, 96, 97, 101, 112
  value of, 119
Spain:
  exports, 210
  imports, 210
Sweden:
  exports, 220
  imports, 220
  production, 220
United Kingdom:
  exports, 206, 209
  imports, 208, 209
  shipments, 203, 204
U.S. exports, 142, 144
  manufacturers, 157, 158
U.S. imports of, 131, 132
in use, 264
Mining:
  U.S. investment in foreign, 47
Motor vehicles, xii-xiii
  capacity utilization, 25, 26
  capital expenditures, 15, 18
  compensation, 242, 243
  inventories, 31
  production indexes, 27
  shipments, 34
Multifunction machines:
  in use, 264

—N—

National defense purchases:
  actual and projected, 7
Net assets, 22
Net income, ix
Net new orders, xiii-xiv
Net operating profit, ix
Net profit on sales, ix
Net sales, 255, xv
Net value:
  of property, plant, and equipment, 22
Netherlands:
  cost recovery allowable for tax purposes, 56, 57
  gross national product:
    tax revenue as percent of, 51
  machine tools:
    exports, 165, 166, 168, 169, 220
      Czechoslovakia, 227
      France, 216
      Italy, 218
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 205
    imports, 165, 166, 168, 169, 223
      Czechoslovakia, 227
      France, 215
      Italy, 218
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 205
    production, 165, 166, 168, 169
  metal cutting machine tools,
    exports, 172
      Germany, 190, 192
    imports, 171
      Japan, 199
    production, 170
  metal forming machine tools:
    exports, 172
      Germany, 193
    imports, 171
      Germany, 192
    production, 170
  U.S. exports:

    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 140
  U.S. imports:
    cutting machine tools, 129
    machine tools, 128
New hires:
  labor turnover, ix-x
    metal cutting industry, 236
New orders:
  consumer goods, 29
  machine tools, 36
    France, 214
    United Kingdom, 202
  numerically controlled machine tools:
    United Kingdom, 203
  of manufacturers, 32, 33
  metal cutting tools, 78, 79, 82-83, 88-91
  metal forming tools, 78, 79, 82-83, 88-91
  metalworking machinery, 36
New Zealand:
  direct foreign investments in, 13
  machine tools:
    exports, Sweden, 221
    imports, Sweden, 221
  U.S. exports:
    machine tools, 137
    metal cutting, 139
    metal forming, 141
    U.S. investment in, 47
Nondefense:
  inventories, 31
  new orders, 32
  shipments, 34
  unfilled orders, 32
Non-durable goods:
  defense purchases, 39
Non-electrical machinery, xiii
  capital appropriations and backlog of, 20
  capital expenditures, 15, 18
  compensation, 242, 243
  gross book value of depreciable assets, 21
  inventories, 31
  machine tools:
  in use, 261, 262
  net value of property, plant, and equipment, 22
  new orders, 33
  new projects, 15
  overtime hours, 245
  production indexes, 27
  shipments, 34, 45
  unfilled orders, 33
  in use, 265
Nonhydraulic presses:
  exports:
    European Economic Community countries, 183
  imports:
    European Economic Community countries, 181
Nonhydraulic shearing machines:
  exports:
    European Economic Community countries, 183
  imports:
    European Economic Community countries, 181
North America:
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 141
  see also specific countries
Norway:
  machine tools:
    exports, 168, 169
      Czechoslovakia, 227
      France, 216
      Sweden, 221
    imports, 168, 169
      Czechoslovakia , 227
      Sweden, 221
    production, 167, 169
  metal cutting machine tools:
    exports, 172
    imports, 171
      Germany, 190
      Japan, 199
    production, 170
  metal forming machine tools:

        exports, 172
        imports, 171
            Germany, 191
        production, 170
    U.S. exports:
        machine tools, 136
        metal cutting machine tools, 138
        metal forming machine tools, 140
    U.S. imports:
        machine tools, 128
Numerical controls (NC), xiii
Numerically controlled machine tools (N/C):
    French production and exports of, 211
    shipments, 100-102
    unfilled orders, 100-102
    in use, 266
Numerically controlled metal cutting machine tools:
    Japan:
        production, 198
        trade with U.S., 198

—O—

Oceania:
    U.S. exports:
        machine tools, 137
        metal cutting machine tools, 139
        metal forming machine tools, 141
    see also specific countries
OPEC:
    trade, 52
Operating profit: 255
Operating profit, ix
Orders, xiii-xiv
    see also New orders
Ordnance and accessories:
    machine tools:
        in use, 262
    except vehicles and guided missiles, xiv
    in use, 265
Output, see Productivity
Overtime, viii

—P—

Pacific:
    capital expenditures, 14
    U.S. investment in, 47
    see also specific countries
Pakistan:
    machine tools:
        exports, Switzerland, 222
        imports, Switzerland, 222
Payroll, 238, 239, xiv
    metal cutting machine tool industry, 243
    metal forming machine tool industry, 243
People's Republic of China:
    machine tools:
        exports:
            Czechoslovakia, 227
            Switzerland, 222
        imports:
            Czechoslovakia, 227
            France, 215
            Switzerland, 222
    metal cutting machine tools:
        imports:
            Germany, 190
            Japan, 199
    metal forming machine tools:
        imports, Germany, 191
    U.S. trade with, 52
    see also China
Personal consumption expenditures, 6
    price deflators, 7
Peru:
    machine tools:
        exports, Czechoslovakia, 227
        imports, Czechoslovakia, 227
    U.S. exports:
        machine tools, 136
        metal cutting, 138
        metal forming, 140
Petroleum:
    U.S. investment in foreign, 47
Philippines:
    metal cutting machine tools:
        imports, Japan, 199
    U.S. exports:

    machine tools, 137
    metal cutting machine tools, 139
    metal forming machine tools, 141
Piercing machines:
  imports:
    European Economic Community
      countries, 182
Planing machines:
  exports:
    European Economic Community
      countries, 182
  imports:
    European Economic Community
      countries, 180, 181
  Japan:
      exports, 196, 197
      imports, 196, 201
      production, 196
  military prime contract awards
    for, 120
  Spain:
    exports, 210
    imports, 210
  U.S. exports, 142, 144
  in use, 264
Planers and shapers:
  Sweden:
    exports, 220
    imports, 220
    production, 220
Planing, shaping and broaching
  machines:
  Germany:
    exports, 188
    imports, 189
    production, 187
Planing, shaping and slotting
  machines:
  United Kingdom:
    shipments, 204
Plant and equipment:
  expenditures for new, xiv
    actual and projected, 7
  orders for, 29
Plate, sheet bending and forming
  machines:
  United Kingdom:
    shipments, 205
Poland:
  imports, 178
  machinery:
    exports, 232
  machine tools:
    consumption, 163
    exports, 165, 166
      Czechoslovakia, 227
      France, 216
      Italy, 218, 219
      Spain, 211
      Switzerland, 222
      United Kingdom, 205
    imports, 165, 166
      Czechoslovakia, 227
      France, 215
      Italy, 218
      Spain, 211
      Switzerland, 222
      United Kingdom, 205, 232
    production, 165, 166
  metal cutting machine tools:
    exports:
      Germany, 192
      Japan, 200
    imports:
      Germany, 190
      Japan, 197, 199
    production, 229
  metal forming machine tools:
    exports:
      Germany, 193
    imports:
      Germany, 191
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 140
  U.S. imports:
    cutting machine tools, 129
    machine tools, 128
Polishing machines:
  imports, 126
    European Economic Community
      countries, 180
  shipments, 92, 96, 97, 107, 108

Polishing (and buffing) machines:
  in use, 264
Portugal:
  machine tools:
    exports, 165, 166, 168, 169
      France, 215
      Spain, 211
      Sweden, 221
    imports, 165, 166, 168, 169
      France, 215
      Spain, 211
      Sweden, 221
    production, 165, 166, 168, 169
  metal cutting machine tools:
    exports, 172
    imports, 171
      Germany, 190
    production, 170
  metal forming machine tools:
    exports, 172
    imports, 171
      Germany, 191
    production, 170
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 140
Power shearing:
  U.S. exports:
    manufacturers, 157, 158
Precision instruments, ix, xiv
  machine tools:
    in use, 262, 265
Presses:
  Czechoslovakia:
    production, 226
  exports:
    European Economic Community
      countries, 183
    worldwide, 172
  France:
    exports, 217
    imports, 217
    production, 212, 213
  imports:
    European Economic Community
      countries, 181
    worldwide, 171
  mechanical:
      shipments, 115
  Netherlands:
      exports, 223
      imports, 223
  production:
      worldwide, 170
  shipments, 92, 98, 99
      value of, 119
  Spain:
      exports, 210
      imports, 210
  Sweden:
    exports, 220
    imports, 220
    production, 220
  United Kingdom:
    shipments, 205
  U.S. exports, 155
    manufacturers, 159
  U.S. imports, 133
Price deflators, 7
  actual and projected, 7
  defense purchases, 39
Price index, xiv-xv
  producer, 38
    machine tools, 41
Prices:
  change in sensitive, 29
Primary metals:
  inventories, 31
  machine tools:
    in use, 262
  new orders, 32
  production indexes, 27
  shipments, 34
  unfilled orders, 32
  in use, 265
Primary products, xv
Primary specialization ratio, 59
Private investment:
  gross domestic, 6
  gross national product and, 10, 11
Producer price indexes:
  machine tool, 38
Producers' durable equipment, xv
  price deflators, 7
Production:

  machine tools:
    worldwide, 162, 163, 165, 166, 167
  metal cutting machine tools:
    worldwide, 169, 170
  metal forming machine tools:
    worldwide, 169, 170
Production workers, xv
Productivity, 28, 252, xv
  worldwide, 54, 55
  see also Industrial production
Profit, 7, 8, 256, 257, ix
Public utilities:
  new projects, 15
Punching machines:
  imports:
    European Economic Community countries, 181
  shipments, 92, 98, 99, 117,
    value of, 119
  U.S. imports, 134
Punching and shearing machines:
  exports:
    worldwide, 172
  France:
    production, 212, 213
  imports:
    worldwide, 171
  military prime contract awards for, 119
  production:
    worldwide, 170
  Sweden:
    exports, 220
    imports, 220
    production, 220
  United Kingdom:
    shipments, 205
  U.S. exports, 143, 145, 155
    manufacturers, 159
  in use, 264
Punching, shearing, bending and forming machines:
  France:
    exports, 217
    imports, 217
Punching and stamping machines:
  exports:
    European Economic Community countries, 183
  imports:
    European Economic Community countries, 183

—Q—

Quits:
  labor turnover, ix-x
    metal cutting machine tool industry, 238

—R—

Real Gross National Product (GNP), xv
  trends, 44
Republic of Korea:
  imports, 175
  metal cutting machines:
    imports, Japan, 197, 199
  U.S. exports:
    metal forming machine tools, 141
  see also Korea; Korea, Republic of
Republic of South Africa:
  machine tools:
    exports:
      Italy, 218, 219
    imports:
      France, 215
      Italy, 218, 219
  metal cutting machine tools:
    imports:
      Germany, 190
  metal forming machine tools:
    imports:
      Germany, 191
  U.S. exports:
    machine tools, 137
    metal cutting machine tools, 139
    metal forming machine tools, 141
  see also South Africa
Riveting machines:
  military prime contract awards for, 120
  United Kingdom:
    shipments, 205
  in use, 264
Rolling machines:

  imports:
    European Economic Community countries, 181
Rolling (bending, folding and planing) machines:
  exports:
    European Economic Community countries, 183
Rolls, bending machines and parts:
  Canada:
    imports, 223
Romania:
  imports, 178
  machinery:
    exports, 232
  machine tools:
    consumption, 163
    exports, 165, 166
      Czechoslovakia, 226
      France, 216
      Italy, 218
      Spain, 211
    imports, 165, 166
      Czechoslovakia, 227
      France, 215
      Italy, 216
      Spain, 211
      United Kingdom, 205
    production, 165, 166
  metal cutting machine tools:
    exports:
      Germany, 192
    imports:
      Germany, 190
      Japan, 197, 199
    production, 229
  metal forming machine tools:
    exports:
      Germany, 193
    imports:
      Germany, 191
  U.S. exports:
    machine tools, 136
    metal cutting machine tools, 138
    metal forming machine tools, 140

—S—

Salary, see Compensation
Sales, 254, xv
Sales, net, total, xv
Saudi Arabia:
  imports, 177
Sawing machines:
  Canada:
    imports, 224
  imports:
    European Economic Community countries, 180
  U.S. imports of, 132
Sawing (and cut-off) machines:
  imports:
    European Economic Community countries, 180, 182
  shipments, 109-110
  United Kingdom:
    shipments, 204
  U.S. exports, 142, 144
    manufacturers, 158
Saws (and filing) machines:
  Germany:
    exports, 188, 190
    imports, 189, 192
    production, 187
  military prime contract awards for, 119
Scheduled weekly hours, viii
Screwing and tapping machines:
  exports:
    European Economic Community countries, 183
  imports:
    European Economic Community countries, 182
Screwing and threading machines:
  United Kingdom:
    shipments, 204
Seasonally adjusted, xv
Secondary products, xv
Separations:
  labor turnover, ix-x
    metal cutting machine tools industry, 238
Shapers:
  shipments, 109-110
  U.S. exports, 142, 144
  in use, 263

Shapers, gear makers and parts:
  Canada:
    imports, 223
Shaping and slotting machines:
  exports:
    European Economic Community countries, 182
  imports:
    European Economic Community countries, 180
Shearing machines:
  Canada:
    imports, 223
  Germany:
    production 187
  imports:
    European Economic Community countries, 181
  Japan:
    exports, 195
    imports, 195
    production, 195
  military prime contract awards for, 120
  shipments, 92, 98, 99, 117
    value of, 119
  U.S. imports of, 133
Shearing (punching and stamping) machines:
  exports:
    European Economic Community countries, 183
Sheet metalworking machines:
  Germany:
    exports, 188, 191
    imports, 189, 193
    production, 187
Shift differential, iv, xv
Shipments, 4, 5
  automatic mechanical metalworking machinery, 101
  bending and forming machines, 116
  boring machines, 92, 96, 97, 103
  broaching machines, 109-110
  drilling machines, 92, 96, 97, 104
  forging machines, 118
  gear cutting and finishing machines, 92, 96, 97, 103
  grinding and finishing machines, 92, 96, 97, 107-108
  grinding and polishing machines, 107-108
  hydraulic and pneumatic metal-working presses, 115
  lathes, 92, 96, 97, 105-106
  machine tool industry, 64
    France, 211
  machine tools, 35, 40, 42
    leading nations, 164
    United Kingdom, 202
  machining centers, 111
  of manufacturers, 34
  mechanical presses, 116
  metal cutting machine tool industry, 63, 65, 67
  metal cutting machine tools, 77
  metal forming machine tool industry, 63, 66, 68
  metal forming machine tools, 114
  metalworking machinery, 35
  milling machines, 92, 96, 97, 112
  numerically controlled machine tools, 100-102
  punching machines, 117
  sawing and cutoff machines, 109-110
  shapers, 109-110
  shearing machines, 117
  United Kingdom:
    metal cutting machine tools, 203
    metal forming machine tools, 205
    numerically controlled machine tools, 203
  value of:
    machine tool industry, 62, 63
  see also Machine tools; Metal cutting
    machine tools; Metal forming machine tools
Shipments - complete machine tools - MQ-35W, xvi
Shipments - complete machine tools - NMTBA, xvii
Shipments - major users and major

  - user categories, xvii
- Shipments - total - census, xvi
- Singapore:
  - machine tools:
    - exports, 165, 166
    - imports, 165, 166
      - United Kingdom, 205
    - production, 165, 166
  - metal cutting machine tools:
    - exports:
      - Japan, 200
    - imports:
      - Germany, 190
      - Japan, 199
  - metal forming machine tools:
    - imports:
      - Germany, 191
  - U.S. exports:
    - machine tools, 137
    - metal cutting machine tools, 139
    - metal forming machine tools, 141
- Smelting:
  - U.S. investment in foreign, 47
- South Africa:
  - capital expenditures, 14
  - direct foreign investments in, 13
  - machine tools:
    - exports, 165, 166
      - Spain, 211
      - Sweden, 221
      - Switzerland, 222
    - imports, 165, 166
      - Spain, 211
      - Sweden, 221
      - Switzerland, 223
      - United Kingdom, 206, 207
    - production, 165, 166
  - metal cutting machine tools:
    - imports:
      - Japan, 199
  - U.S. investment in, 47
  - see also Republic of South Africa
- South America:
  - metal cutting machine tools:
    - imports:
      - Germany, 190
  - U.S. exports:
    - machine tools, 136
    - metal cutting machine tools, 138
    - metal forming machine tools, 140
  - see also specific countries
- South Korea:
  - machine tools:
    - imports:
      - United Kingdom, 205
  - metal cutting machine tools:
    - imports:
      - Germany, 190
  - metal forming machine tools:
    - imports:
      - Germany, 191
- Soviet Union:
  - machine tools:
    - exports, 165, 166
    - imports, 165, 166
    - production, 165, 166
    - shipments, 164
  - see also U.S.S.R.
- Spain:
  - imports, 175
  - machine tools:
    - consumption, 163
    - exports, 165, 166, 168, 169 211
      - Czechoslovakia, 227
      - France, 216
      - Italy, 218
      - Netherlands, 223
      - Sweden, 221
      - Switzerland, 222
      - United Kingdom, 205
    - imports, 165, 166, 168, 169, 211
      - Czechoslovakia, 227
      - France, 215
      - Italy, 218
      - Netherlands, 223
      - Sweden, 221
      - Switzerland, 222
      - United Kingdom, 205
    - production, 165, 166, 168, 169

- metal cutting machine tools:
  - exports, 172, 210
    - Germany, 192
  - imports, 171, 210
    - Germany, 190
  - production, 170
- metal forming machine tools:
  - exports, 172, 210
    - Germany, 193
  - imports, 171, 210
    - Germany, 191
  - production, 170
- U.S. exports:
  - machine tools, 136
  - metal cutting, 138
  - metal forming, 140
- U.S. imports:
  - cutting machine tools, 129
  - machine tools, 128

Special machines:
- Japan:
  - production, 198

Special way-type and transfer machines:
- in use, 264

Straightening machines:
- Netherlands:
  - exports, 224
  - imports, 224

Stockholders' equity, xvii

Straight-time hourly earnings, v
- see also Compensation

Structure and additions, see Plant and equipment

Supplementary benefits, iii-iv

Sweden:
- compensation, 53, 249
- consumer prices, 48, 49
- cost recovery allowable for tax purposes, 56, 57
- export market share of, 173-179
- gross national product:
  - tax revenue as percent of, 58
- machine tools:
  - consumption, 163
  - exports, 165, 166, 168, 169 220-221
    - Czechoslovakia, 227
    - France, 216
    - Italy, 218
    - Netherlands, 223
    - Spain, 211
    - Switzerland, 222
    - United Kingdom, 205
  - imports, 165, 166, 168, 169 220-221
    - Czechoslovakia, 227
    - France, 215
    - Italy, 218
    - Netherlands, 223
    - Spain, 211
    - Switzerland, 222
    - United Kingdom, 205
  - production, 165, 166, 168 169, 220
- metal cutting machine tools:
  - exports, 172
    - Germany, 192
    - Japan, 200
  - imports, 171
    - Germany, 190
    - Japan, 199
  - production, 172
- metal forming machine tools:
  - exports, 172
    - Germany, 193
  - imports, 171
    - Germany, 191
  - production, 170
- productivity, 54
- U.S. exports:
  - machine tools, 136
  - metal cutting, 138
  - metal forming machine tools: 140
- U.S. imports:
  - cutting machine tools, 129
  - forming machine tools, 129
  - machine tools, 128
  - wholesale prices, 49, 50

Switzerland:
- compensation, 249, 250
- export market share of, 173-179
- gross national product:

- tax revenue as percent of, 58
- imports, 174
- machine tools:
    - consumption, 163
    - exports, 165, 166, 167, 169, 222
        - Communist countries, 230-231
    - Czechoslovakia, 227
    - France, 216
    - Italy, 218
    - Netherlands, 223
    - Spain, 211
    - Sweden, 221
    - United Kingdom, 208, 209
  - imports, 165, 166, 168, 169 222
    - Czechoslovakia, 227
    - France, 215
    - Italy, 220
    - Netherlands, 223
    - Spain, 214
    - Sweden, 221
    - United Kingdom, 205
  - production, 165, 166, 168 169
  - metal cutting machine tools:
    - exports, 172
        - Germany, 192
        - Japan, 200, 201
    - imports, 171
        - Germany, 190
    - production, 170
  - metal forming machine tools:
    - exports, 172
        - Germany, 193
    - imports, 171
        - Germany, 191
    - production, 170
  - U.S. exports:
    - machine tools, 136
    - metal cutting, 138
    - metal forming, 140
  - U.S. imports:
    - cutting machine tools, 129
    - forming machine tools, 129
    - machine tools, 128, 134

—T—

- Taiwan:
    - machine tools:
        - exports, 165, 166
            - France, 216
            - United Kingdom, 205
        - imports, 165, 166
            - United Kingdom, 205
        - production, 165, 166
    - metal cutting machines:
        - exports, Japan, 200
        - imports, Japan, 197, 199
    - U.S. exports:
        - machine tools, 137
        - metal cutting, 139
        - metal forming, 141
    - U.S. imports:
        - cutting machine tools, 129
        - machine tools, 128
- Tapping machines:
    - U.S. exports, 144
    - in use, 264
- Tax:
    - corporate profit and, 8
    - cost recovery of, 56-57
    - revenues:
        - as percent of GNP, 58
- Thailand:
    - metal cutting machine tools:
        - imports:
            - Japan, 199
- Threading machines:
    - U.S. exports, 144
    - in use, 264
- Trade:
    - balance of payments, 43
        - worldwide, 53
    - see also Balance of trade; Exports; Imports
- Transfer machines:
    - Canada:
        - imports, 224
    - U.S. exports:
        - manufacturers, 158
- Transfer and single station machines:
    - United Kingdom:

    - shipments, 204
- Transportation equipment, xvii
  - capital expenditures, 15
  - gross book value of depreciable assets, 21
  - inventories, 31
  - machine tools:
    - in use, 262
  - net value of property, plant, and equipment, 22
  - new orders, 33
  - new projects, 15
  - production indexes, 27
  - shipments, 34
  - unfilled orders, 33
  - in use, 265
- Turkey:
  - imports, 176
  - machine tools:
    - exports:
      - Czechoslovakia, 227
      - Italy, 218
    - imports:
      - Czechoslovakia, 227
      - France, 215
      - Italy, 218
      - United Kingdom, 205
  - U.S. exports:
    - machine tools, 137
    - metal cutting machine tools, 139
    - metal forming machine tools, 141
- Turning machines:
  - in use, 264
- Turret lathes:
  - Germany:
    - exports, 190
    - imports, 192
- Turret lathes, automatic:
  - Germany:
    - exports, 188
    - imports, 189
    - production, 187

—U—

- Ultrasonic erosion machines:
  - military prime contract awards for, 119
- Unemployment rate:
  - actual and projected, 7
- Unfilled orders, xiv
  - automatic mechanical metalworking machinery, 101
  - imports, 130
  - machine tools, 37
    - United Kingdom, 202
  - metal cutting tools, 79
  - metal forming tools, 79
  - metalworking machinery, 37
  - numerically controlled machine tools, 100-102
  - of manufacturers, 32, 33
- Unit labor cost, xvii
- United Kingdom:
  - balance of trade, 53
  - capital expenditures, 14
  - compensation, 53, 55, 249, 250
  - consumer prices, 48, 49
  - cost recovery allowable for tax purposes, 56, 57
  - direct foreign investments in, 13
  - export market share of, 173-179
  - exports:
    - financing, 46
    - unit value of, 51
  - gross national product, 44
    - tax revenue as percent of, 58
  - imports, 174
    - percent of domestic consumption, 184, 185
  - industrial production, 47
  - investment patterns, 45
  - machine tool industry employment, 202
  - machine tools:
    - consumption, 163
    - exports, 165, 166, 168, 169 182, 183, 205, 206, 207
      - Czechoslovakia, 227
      - France, 216
      - Italy, 218

    Netherlands, 223
    Spain, 211
    Sweden, 221
    Switzerland, 222
  imports, 165, 166, 168, 169, 180, 181, 205, 208, 209
    Czechoslovakia, 227
    France, 215
    Italy, 218
    Netherlands, 223
    Spain, 211
    Sweden, 221
    Switzerland, 222
  net new orders, 202
  production, 165, 166, 168, 169
  shipments, 164, 202
  unfilled orders, 202
  in use, 261
metal cutting machine tools:
  exports, 172
    Germany, 192
    Japan, 200
  imports, 171
    Germany, 190
    Japan, 199
  production, 170
  shipments, 204
metal forming machine tools:
  exports, 172
    Germany, 193
  imports, 171
    Germany, 191
  production, 170
  shipments, 205
numerically controlled machine tools:
  new orders, 203
  shipments, 203
productivity, 54, 55
trade, 52
U.S. exports:
  machine tools, 136
  metal cutting machine tools, 138
  metal forming machine tools, 140
U.S. imports:
  cutting machine tools, 129
  forming machine tools, 129
  machine tools, 128, 134
  U.S. investment in, 47
  wholesale prices, 49, 50
United States:
  balance of trade, 53
  compensation, 53, 55, 246, 247
  consumer prices, 48, 49
  cost recovery allowable for tax purposes, 56, 57
  export market share of, 173-179
  exports:
    financing, 46
    unit value of, 51
  foreign investment, 47
  gross national product, 44
    tax revenue as percent of, 58
  imports, 173
    percent of domestic consumption, 184
  industrial production, 47
  investment patterns, 45
  machinery:
    imports, 232
  machine tools:
    consumption, 163
    exports, 165, 166, 168, 169
      Communist countries, 230-231
      Czechoslovakia, 227
      France, 216
      Italy, 218
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 208, 209
    imports, 165, 166, 168, 169
      Czechoslovakia, 227
      France, 215
      Italy, 218
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 205, 206, 207
    production, 165, 166, 168, 169
    shipments, 164
    in use, 259
  metal cutting machine tools:

    - exports, 172
      - Germany, 191
      - Japan, 201
    - imports, 171
      - Germany, 190
      - Japan, 197, 199, 200
    - production, 170, 229
  - metal forming machine tools:
    - exports, 172
      - Germany, 193
    - imports, 171
      - Germany, 191
    - production, 170, 228
  - productivity, 54, 55
  - trade, 52
  - wholesale prices, 49, 50
- U.S.S.R.:
  - gross national product, 44
  - industrial production, 228
  - machinery:
    - exports, 232
  - machine tool industry:
    - production, 228
  - machine tools:
    - consumption, 163
    - exports:
      - Czechoslovakia, 227
      - France, 216
      - Italy, 218
      - Spain, 211
      - Switzerland, 222
    - imports:
      - Czechoslovakia, 227
      - France, 215
      - Italy, 218
      - Spain, 211
      - Switzerland, 222
      - United Kingdom, 205, 206, 207
  - metal cutting machine tools:
    - exports:
      - Germany, 192
      - Japan, 200, 201
    - imports:
      - Germany, 190
      - Japan, 197, 199
    - production, 227, 228
  - metal forming machine tools:
    - exports:
      - Germany, 193
    - imports:
      - Germany, 191
    - production, 229
  - trade, 51
  - U.S. exports:
    - machine tools, 136
    - metal cutting, 138
    - metal forming, 140
  - U.S. trade with, 52
  - see also Soviet Union
- Utilities, public:
  - new projects, 15

—V—

- Vacations, paid, iii-iv
- Value added, xviii
- Value added per employee:
  - metal cutting machine tool industry, 244
  - metal forming machine tool industry, 244
- Value added by manufacturer:
  - machine tool industry, 62, 63, 64
  - metal cutting machine tool industry, 63, 65, 67
  - metal forming machine tool industry, 63, 66, 68
- Value, in foreign country, see imports into U.S.
- Value, at port, see Exports of domestic merchandise
- Value of shipments, see Shipments
- Venezuela:
  - imports, 176
  - machine tools:
    - exports:
      - Czechoslovakia, 227
      - Ita1y, 218
      - Spain, 211
    - imports:
      - Czechoslovakia, 227
      - France, 215
      - Ita1y, 218
      - Spain, 211
  - metal cutting machine tools:
    - imports:
      - Germany, 190

metal forming machine tools:
  imports:
    Germany, 191
U.S. exports:
  machine tools, 136
  metal cutting, 138
  metal forming, 140

—W—

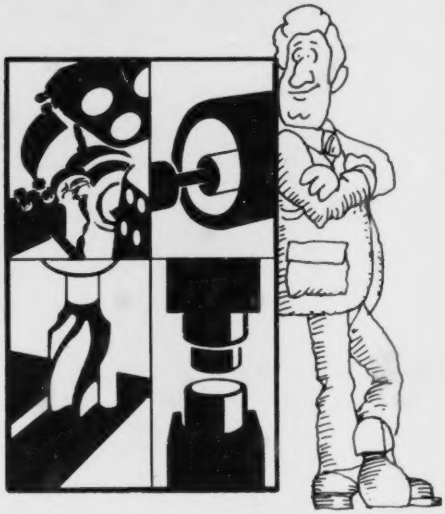
Wages, see Compensation
Western Europe:
  direct foreign investments in, 13
  metal cutting machine tools:
    imports:
      Germany, 190
  U.S. investment in, 47
  see also specific countries
West Germany:
  balance of trade, 53
  compensation, 53, 55, 249
  consumer prices, 48, 49
  cost recovery allowable for tax purposes, 56, 57
  export market share of, 173-179
  exports:
    financing, 46
    unit value of, 51
  gross national product, 44
    tax revenue as percent of, 58
  imports, 173
    percent of domestic consumption, 184, 185
  industrial production, 47
  investment patterns, 45
  machine tool industry:
    employees, 186
    exports, 186
    imports, 186
    production, 186, 187
  machine tools:
    consumption, 163
    exports, 165, 166, 168, 169 182, 183
      Communist countries, 230, 231
      Czechoslovakia, 227
      France, 216
      Italy, 218
      Netherlands, 223
      Spain, 211
      Sweden, 221
      Switzerland, 222
      United Kingdom, 208, 209
    imports, 165, 166, 168, 169 180, 181
      Czechoslovakia, 227
      France, 215
      Italy, 218
      Netherlands, 223
      Spain, 211
      Sweden, 223
      Switzerland, 222
      United Kingdom, 205, 206, 207
    production, 165, 166, 168, 169
    shipments, 164
    in use, 261
  metal cutting machine tools:
    exports, 172, 188, 190
      Japan, 200, 201
    imports, 171, 189, 192
      Japan, 197, 199
    production, 170, 187
  metal forming machine tools:
    exports, 172, 188, 191
    imports, 171, 189, 193
    production, 170, 187
  productivity, 54, 55
  trade, 52
  U.S. exports:
    machine tools, 136
    metal cutting, 138
    metal forming, 140
  U.S. imports:
    cutting machine tools, 129
    forming machine tools, 129
    machine tools, 128, 134
  U.S. investment in, 47
  wholesale prices, 49, 50
West Samoa:
  machine tools:
    exports, Sweden, 221
    imports, Sweden, 221
Wholesale prices:
  worldwide, 49, 50
Wire drawing machines:

- France:
  - exports, 217
  - imports, 217
- Wire forming machines:
  - Japan:
    - exports, 195
    - imports, 195
    - production, 195
- Wire, strip drawing and working machines:
  - United Kingdom:
    - shipments, 205
- Wire working machines:
  - Germany:
    - exports, 188, 191
    - imports, 189, 193
    - production, 187
- Working capital, 255
- World trade, see Exports; Imports; and specific countries

—Y—

- Yugoslavia:
  - imports, 178
  - machine tools:
    - consumption, 163
    - exports, 165, 166
      - Czechoslovakia, 227
      - France, 215
      - Switzerland, 222
    - imports, 165, 166
      - Czechoslovakia, 227
      - France, 216
      - Switzerland, 222
    - production, 165, 166
  - metal cutting machine tools:
    - exports:
      - Germany, 192
    - imports:
      - Germany, 190
  - metal forming machine tools:
    - exports:
      - Germany, 193
    - imports:
      - Germany, 191
  - U.S. exports:
    - machine tools, 136
    - metal cutting, 138
    - metal forming, 140

MACHINE TOOLS: The simple facts about a complex industry



The National Machine Tool Builders' Association now offers—free of charge—four full-color booklets that explain machine tools—what they are and what they do.

Simply written and beautifully illustrated, these booklets define and discuss the machine tool industry. From its origins to the latest techniques. They explain concepts, processes and applications. And offer guidance in career opportunities.

The series is ideal for education and training. For job entry programs. For use as a concise reference source. Or simply for promoting better understanding of the machine tool industry.

nmtba
national
machine
tool builders'
association

nmtba

McCORMICK PLACE WEST
McCORMICK PLACE EAST
imts
84
O'HARE EXPO CENTER

**1984 INTERNATIONAL
MACHINE TOOL SHOW**
SEPTEMBER 5–13, 1984 · CHICAGO, ILLINOIS, USA

SPC/2M/9-83